

THE JOURNAL

OF THE

ROYAL UNITED SERVICE INSTITUTION.

VOL. L.

FEBRUARY, 1906.

No. 336.

[Authors alone are responsible for the contents of their respective Papers.]

SECRETARY'S NOTES.

1. The following officers became members of the Institution during the month of January :—

Captain G. C. Buxton, Norfolk Imperial Yeomanry.
Captain C. M. Nuttall, R.G.A.
Major G. E. Tuson, D.S.O., 16th Lancers.
Lieutenant L. W. Lucas, East Kent Regiment.
Lieutenant D. V. M. Balders, Suffolk Regiment.
Captain Lord A. E. Browne, R.F.A.
Captain F. W. A. Anderson, Manchester Regiment.
Captain R. J. Slaughter, A.S.C.
Captain A. S. Cotton, R.H.A.
Lieutenant A. W. Brown, 1st V.B. Northamptonshire Regiment.
Captain R. Barclay, Sussex R.G.A. (M.)
Lieutenant C. B. B. White, Royal Australian Artillery.
Captain R. G. B. Armstrong, R.M.L.I.
Captain M. Moore, A.S.C.
Lieutenant H. Weisberg, City of London Imperial Yeomanry.
Midshipman E. W. M. King, R.N.
Major C. D. Vaughan, D.S.O., Border Regiment.
Colonel A. J. Godley, Irish Guards.
Captain G. C. Grazebrook, Royal Inniskilling Fusiliers.
Lieutenant G. H. Loder, Scots Guards.
Major J. Hay, R.F.A.
Second Lieutenant H. H. Baxter, R.F.A.
Assistant-Paymaster J. E. Sorrell, R.N.R.
Lieut.-Colonel the Earl of Romney, late 4th Battalion Bedfordshire Regiment.
Captain H. N. Couchman, Middlesex Regiment.
Lieutenant A. F. P. Wehner, R.G.A.
Major F. W. Moffitt, Essex Regiment.
Lieutenant J. A. Muirhead, Indian Army.
Chief-Paymaster G. B. Townesend, R.N.
Lieutenant L. T. Jones, R.N.
Major R. S. May, Royal Fusiliers.
Major C. K. Burnett, 18th Hussars.
Captain W. M. C. Crowe, Royal Warwickshire Regiment.
Lieutenant J. G. Browne, 14th Hussars.
Lieutenant L. B. Clöete, Indian Army.
Major H. W. Hodgson, 15th Hussars.
Captain E. de A. Le Mottée, D.S.O., Gloucestershire Regiment.
Second Lieutenant A. A. C. P. S. Perceval, Irish Guards.

(Two other officers joined the Institution whose names are not included in this list.)

(The above list includes the names of officers of every branch of the Services, which is satisfactory.)

2. On the occasion of the Opening of Parliament by His Majesty the King in State, on 19th February, there will be limited accommodation at the windows of the buildings for members and their friends to witness the Royal Procession. The charge for each ticket will be 7s. 6d., to include light refreshments. Only those in possession of tickets will be admitted to the buildings.

3. The Anniversary Meeting will be held in the Theatre of the Institution at 4 p.m. on Tuesday, 6th March; Field-Marshal Earl Roberts, Chairman of the Council, will preside.

4. The following are the names of the candidates nominated to fill the several vacancies occurring on the Council. A ballot, where necessary, will be taken at the Anniversary Meeting:—

Naval (1 Vacancy).

Captain Honble. A. E. Bethell, C.M.G., R.N. (Assistant Director of Naval Ordnance).

Vice-Admiral Sir R. N. Custance, K.C.M.G., C.V.O.

Royal Naval Reserve (1 Vacancy).

Commander W. F. Caborne, C.B., R.N.R. (for re-election).

Regular Army (3 Vacancies).

Colonel Honble. J. T. St. Aubyn, C.V.O., Commanding Grenadier Guards.

Brigadier-General C. G. Donald, C.B. (for re-election).

Colonel L. A. Hale (for re-election).

Colonel Honble. O. V. G. A. Lumley, late Commanding 11th Hussars, h.p.

Major-General G. U. Prior, p.s.c. (for re-election).

Colonel F. W. Romilly, C.B., D.S.O., p.s.c., Commanding Scots Guards.

Militia (1 Vacancy).

Colonel the Viscount Hardinge, Commanding 7th Battalion The Rifle Brigade.

Colonel W. A. Hill, C.B. (for re-election).

Yeomanry (1 Vacancy).

Colonel R. B. Colvin, C.B., Commanding Essex Imperial Yeomanry.

Major W. B. Stewart, Lothians and Berwickshire Imperial Yeomanry.

Volunteers (2 Vacancies).

Colonel E. H. Bailey, V.D., Commanding 1st V.B. East Surrey Regiment.

Colonel T. S. Cave, V.D., Commanding 1st V.B. The Hampshire Regiment (for re-election).

Sir G. H. Chubb, Bart., late Captain, 4th V.B. East Surrey Regiment (for re-election).

Colonel W. C. Horsley, V.D., Commanding 20th Middlesex V.R.C. (Artists).

Colonel Sir H. Roberts, Bart, V.D., Commanding 16th Middlesex V.R.C. (London Irish).

Colonel G. Rumsey, Commanding 4th V.B. The Queen's Royal West Surrey Regiment.

5. A further course of Military History Lectures, commencing the last week in March, and dealing with the subjects set for the May promotion examinations, will be held in the Theatre of the Institution. The course will comprise ten lectures. The fee to attend the course will be half-a-guinea for members of the Institution, and a guinea for non-members. The lecturer will be Doctor T. M. Maguire, and due notice of the dates of the lectures will be given in the Service papers and in these Notes in the March number.

MILITARY CYCLING AND THE HOME ARMY.

By Major R. A. JOHNSON, 1st V.B. Hampshire Regiment.

Thursday, 26th October, 1905.

Major-General Sir J. F. MAURICE, K.C.B., in the Chair.

IN expressing to you my high sense of the great honour that I feel it, to be allowed to address you this afternoon, I must confess that I have accepted the invitation of the Council to do so with some little hesitation. It has become more and more evident to me that I can claim no expert knowledge whatever on the subject of military cycling, and there are many officers—some of whom I am glad to see present in this hall—who are much better qualified to express opinions on this subject than I am.

In asking you, therefore, to follow my very elementary summary of the place which military cycling holds, or might hold, in the strategy and tactics of modern warfare, I beg that you will regard my remarks as made rather with the object of provoking thought and stimulating discussion upon the tactical uses of an arm which has certainly not yet reached its limits of possible development, than as presuming towards anything like an authoritative expression of opinion.

The last lecture that was delivered in this room on the subject of military cycling was from the mouth of no less a person than the distinguished General who has kindly consented to occupy the Chair this afternoon, and I can scarcely hope to add anything of moment to his exhaustive treatment of the subject in 1901. The fact remains, however, that but little real progress has been made in the tactical uses of this arm since the interesting manœuvres conducted by Sir Frederick Maurice in Sussex, in 1901, and that it is only by repeated hammering at the extreme conservatism with which we in England receive anything that has the least pretensions to be new, that we can attain any progress at all. That is why I make bold to suggest to you this afternoon that the use of the cycle in warfare has not yet received from many of our leading tacticians that attention which I know Sir Frederick Maurice is convinced that it should.

The military cyclist first entered the British Army through a back door; that back door was the Volunteer Force. In the Volunteers, too, cycling has attained to a far higher development than it has yet reached in any other branch of the Service. I think it was in 1888 that Volunteer battalions first began to raise cyclist sections, though there were pioneers before those days.

Among these may be mentioned General Sprot, who, in a letter to the *Cyclist*, suggested that men mounted upon bicycles might with advantage be employed as orderlies, and that tricyclists could

efficiently perform the duties of mounted infantry. Next, Major Molyneux, in a letter to the *Volunteer Service Gazette*, in 1882, was much struck with the assembly at the Hampton Court meet of 2,000 members of Cyclist Clubs from all parts of England. In his letter he argued that a cyclist could go double the distance in one day that a horseman could accomplish, that he travels faster and noiselessly, and that his mount does not eat; and he came to the conclusion that valuable military material was latent in these civilian clubs.

But nothing very definite was done until 1887, when General Stracey and Colonel Savile conceived the bold idea of using cyclist scouts in connection with the Dover marching column, and the success of the manoeuvres that then took place led quickly to the formation by authority of several bodies of military cyclists in the Volunteer Force.

The 26th Middlesex—which is well known to you to-day as the only battalion of Volunteer cyclists in the Service—was formed in 1887, under the command of Major Percy Hewitt, late Carabiniers, and in the following year Volunteer battalions began to raise cyclist sections within their establishments, though the strength was limited to 1 officer, 2 non-commissioned officers, 12 to 20 privates, and 1 bugler. At Easter, 1888, some very extensive manoeuvres were undertaken under Colonel Savile's command in the country between Winchester and Salisbury, and from that day forward cyclist manoeuvres have been a feature of every year of training. In dealing with the pioneers of military cycling, I cannot omit the name of Colonel Eustace Balfour, whose practical experience of military cycling extends over 17 years, and has followed him into his retirement from the active list. It is unnecessary for me to expatiate in London on the debt that military cycling owes to Colonel Balfour.

Particular mention should also be made of the Professor of Moral Philosophy at Oxford, who raised the first cyclist section in the University Corps, and compiled what I believe I am right in saying was the first cyclist Drill Book. We may smile at the elaborate evolutions laid down in Captain Cook-Wilson's drill book for forming square to receive cavalry, an essential feature of which were the revolving wheels of the up-turned machine, which were to frighten the horses of the enemy; but the little book had many outstanding merits, and was, to a wonderful degree, in advance of the times. In its pages, for instance, we find two principles enunciated, which are even yet not as fully realised by cyclist officers as I think they should be.

In the first place, Captain Cook-Wilson insists upon the vital importance to cyclists of smart drill, and in order to attain this he goes even so far as to advocate close-order drill mounted in a grass field. I need not, perhaps, enlarge upon the importance of smart drill for cyclists. We all know what march discipline means, and what is the difference between the strategical and tactical value of a regiment of infantry that has it, and one that has it not. It will be obvious that in dealing with cyclists—who must necessarily tail out over undulating country, and occupy an immense length of road—the effectiveness of any considerable body must entirely depend upon their march discipline. Smartness in dismounting and deploying for action, or in doubling back to their machines and speedily

reforming column of route, whether for pursuit or retreat, will often make all the difference when it comes to the point.

Next, Captain Cook-Wilson was one of the first to realise the great value which his mobility lends to the cyclist, not merely as a dispatch rider, but as employed in large numbers as a tactical unit upon the battle-field. He showed how, if properly handled, cyclists could envelop and harass advancing infantry, and he was bold enough to assert—what is scarcely recognised even to-day—that in many cases they may prove altogether a match for cavalry.

These were early days, and I well remember how the first Volunteer cyclists were regarded, half as a joke, half as a nuisance, by commanding officers, who made them the victims of a good deal of abuse at the battalion drill, followed by a march past, which formed so large a part of the Volunteer trainings of the time. These were the days, of course, when the frontal attack in stereotyped formation was held to be of far more importance than operations against a flank, or against lines of communication. These were the days when scouting and reconnaissances were rarely practised in the Auxiliary Forces, and the soldier was so shocked at the straggling and untidy appearance which cyclists on the road will often present, that he missed altogether the significance of the enhanced mobility conferred upon them, even by the machine of that epoch. In the ordinary Volunteer sham-fight the opposing forces rarely occupied more than one mile square of ground from start to finish, so that the speed of the cyclist was a negligible quantity in the battle. In these small engagements he was generally confined to one road, though he might occasionally be asked—half in jest—to advance over a ploughed field. His drill was inchoate, and his machine heavy and of varying pattern. I have seen field days indeed, where some of the men were mounted on tricycles, or even on the old high bicycle of the "ordinary" type. It was always considered to be quite a serious criticism to remind the cyclist that he could not "charge," and when the pneumatic tyre came in it was supposed to be funny to remind him that he might be punctured. Old prejudices die hard, and there are many cavalry men to-day who simply will not discuss the cyclist as worthy of their steel. Sir Frederick Maurice has shown that it is possible for a body of cyclists to ride from Coventry to Hendon, a distance of 100 miles, on a Saturday; on the Sunday, from Hendon to Cuckfield, 75 miles, in pouring rain, and to do excellent work on the Monday. In his official report of the work of this particular body of cyclists, he writes that "the men did not appear to be fatigued." I am afraid it will hardly do to ask our friends of the cavalry where they and their horses would be at the end of such marchings; it would not be a question as to whether they merely "appeared" to be fatigued or no. Nevertheless, four years ago a very distinguished general reported the bicycle to be "a most cumbrous form of transport," and it is only quite recently that the War Office has allowed each Volunteer battalion to maintain more than a section of cyclists. It is fair to the War Office to say that their conversion quite recently has been very rapid, and that they now desire to convert the whole of the Volunteer artillery into cyclist infantry! It is, perhaps, difficult to understand how even the cyclist can wholly take the place of the gunner, but I suppose he should at least be grateful for so flattering a recognition of his worth.

I have said that the development of military cycling and the extension of the sphere of usefulness of the cyclist is due to the inspiration, partly of soldiers and partly of civilians, but the details have been worked out in almost every case by the Volunteers. When we come to look into it, it is quite natural that the Volunteer Force should have been the first foster parents of the military cyclist. In the first place, we Volunteers are admittedly a collection of cranks of all descriptions, or we should hardly be Volunteers in these trying times, and the original cyclists were regarded as the veriest cranks. Next, the Volunteer cyclist contributed his own machine, whereas in the Regular Army it is difficult to find money for mounting the men. Moreover, it soon came to be found that, in recruiting for the cyclist section, Volunteer officers tapped a new class, or, at any rate, a class which, since the days of the early Volunteer movement, had been all too scantily represented in the ranks. A flourishing cyclist section consequently meant so many excellent recruits a year to the good. The rise of a rejuvenated Yeomanry, together with the return of an excessive economy, which has cut down the special grant for wear and tear of machines from £2 to £1, has greatly militated against the popularity of the cyclist during the past year, and I am told that recruiting in some corps is at a standstill. But meantime, the cyclist has been finding his military worth acknowledged, and I have sufficient confidence in my fellow countrymen to believe that when once they are persuaded of the value of his services, there will be no serious difficulty in getting a good proportion of them to come forward, no matter what the expense or inconvenience to themselves may be.

There is a fourth, and even more potent, reason for the popularity of the cyclist with a Volunteer commanding officer, though it does not altogether make for the efficiency of the cyclists themselves. In face of the seeming inability of the authorities to organise the Volunteers into brigades or divisions of all arms, the majority of Volunteer corps go out for their annual training without a gun or sabre to make that training of any real instructional value. Now this is where the cyclist comes in. He takes the place of mounted infantry or cavalry, whether in operations of brigade *versus* brigade, or, more often and with less benefit to himself, in making a skeleton enemy for his battalion. A strong contingent of cyclists is, therefore, invaluable to a Volunteer commanding officer or brigadier, as preventing a manœuvre training from becoming a farce; and this attraction quite counteracts the old and very reasonable prejudice of commanding officers against extras which diminish the fighting strength of the battalion.

As I have said, I am far from applauding this system. I have seen training after training all over England, where the whole time of the cyclists has been wasted in employing them for purposes which are totally alien to their proper rôle. At the same time, under the circumstances, it is difficult to see what commanding officers and brigadiers are to do, or to blame them for looking to the interests of the infantry, who form the larger proportion of their commands. At any rate, it makes for the encouragement and increase of the number of cyclists in the Volunteer Force, which is, admittedly, a thing very much to be desired. The tactical absurdity of the uses to which cyclists are often put is only one of a whole host of absurdities

produced by the presence of 350,000 men in the Auxiliary Forces, who have never yet been mobilised or trained as an Army.

In the Regular Army military cycling has also made rapid progress of recent years, and I am told that this is more particularly so with some of our cavalry regiments, but even so in the Regular Army the cyclist is rarely regarded as more than a very valuable person for scouting and dispatch riding; and there has been no attempt to organise him or employ him in formed bodies as a separate arm, as there has been with that other form of mobile infantryman—the infantryman who is mounted on a horse.

Now, what I wish to discuss with you this afternoon, if you will allow me, is the strength and weakness of the cyclist as a separate arm. As a dispatch rider, and even as a scout, he has come to stay in most Armies of the world, but, strangely enough, his position in the line of battle is not recognised as, I think, it should be. The British Army has made its infantry mobile by mounting them upon horses, upon waggons, upon camels, or even upon elephants, but it seems to stop short at the bicycle. In Continental Armies the large masses of cavalry which are available have already made the mounted infantryman unnecessary, and there would be less wonder, therefore, if they did not trouble themselves about cyclists.

Nevertheless, military cyclists have long been assigned a definite rôle in Continental Armies, as scouts and dispatch riders. Not only so, but in the late German Manœuvres a company of cyclists formed part of the Blue cavalry division, and did excellent work on the flanks of that division on its march from Nassau to Ruppertshofen. In the French Manœuvres in Champagne, I am told that a complete battalion of cyclists appeared for the first time, and although this battalion is an experiment at present, and an experiment which is not favoured by one section of the French Army, there is a considerable party among the younger men who believe that military cycling has a great tactical future before it. The battalion to which I refer marched on the great Routes Nationales in the nearest approach possible to column of fours, headed by a band also mounted on cycles, to the strains of which the pedalling kept time. I am further informed by an eye-witness that on one occasion this battalion was used with great effect against a cavalry charge. The battalion cycled up a road to the flank of the charging cavalry, where they were able to pour a rapid flank fire into the charging squadrons to such good purpose that the cavalry were put out of action.

In discussing the strong and weak points of the cyclist as a tactical unit, I will make concession to his critics by taking his weak points first. In enunciating them I am merely announcing platitudes, but perhaps it is not sufficiently recognised how these platitudes work themselves out in detail.

My first platitude is that *cyclists are confined to the roads*. They are, therefore, always moving through a defile. I am aware that many ingenious officers have attempted to get round this very obvious difficulty, and Colonel Savile—I think it was—believed that no country was really impassable to a cyclist. Still, the fact remains that if we are to make any use of the great speed, which is the essential virtue of the cyclist, we must confine him pretty strictly to the roads. Cyclists, therefore, are not the best of all possible advanced guards. If they have flankers out, their speed is little greater than that of infantry; if, on the other hand, they have not flankers out,

they are liable to a "Sanna's Post" at every turn in the road. Next, because they are confined to the roads they make but poor flank guards to an advancing column. It is sometimes considered that if you place a company of cyclists on roads parallel to that upon which the main column is advancing, and take adequate care that touch shall be maintained at every cross road or lane, the column is sufficiently secure against surprise from any flank. I think that if I give you an illustration of what happened on a certain occasion when this was done, I shall show the dangers of such a course. The practical illustrations which I am about to give of various points as they arise, are unfortunately drawn from my own experiences at peace manœuvres. I must ask my audience to forgive me for trying to point the moral in a discussion on one aspect of war by a relation of only bloodless encounters, though it may lend a tinge of reality when I tell you that these encounters were not always quite so bloodless as they sound.

The battalion to which I belong was on the march from Winchester to Petersfield; the right flank was the flank in danger, and consequently, a company of cyclists was placed upon the road which leads parallel to the Winchester-Petersfield road, and roughly, half a mile to the north of it. Our enemy were the Hampshire Yeomanry; they descended upon the front and rear of the cyclist company, and though they could make no headway against the fire that these were able to develop upon them, they succeeded in delaying the flank guard, and not only so, but in riding round it and blocking the lateral roads which lay between it and the column. The consequence was, that the flank guard became isolated, and a part of the Yeomanry were thus free to operate against the column itself.

An infantry flank guard had accordingly to be detailed, and the very fact which led to the isolation of the cyclists, viz., the enclosed and wooded nature of the country through which we were passing, made the advance of these flankers so slow that operations had to be altogether suspended in order to allow the column to reach its scheduled destination that day.

There are, of course, partial remedies for these glaring defects. In a country that is well supplied with roads, an advance composed solely of cyclists should not be confined to a single road. It would naturally occupy a broad front and move in parallel columns upon three or four parallel or converging roads. Such roads are not, however, always to be found within two to three miles of each other even in a country which is so well supplied with roads as our own. If they were so to be found, it would be probable that an enemy that attempted to resist the advance guard upon one of these roads would not maintain himself for long unless he were in very considerable strength, in terror that he might be outflanked and cut off by the other columns of the cyclist advance guard on the roads to the left and right of the point of resistance. In cases where parallel roads do not exist, it is, of course, quite possible for cyclists to do careful and thorough advance guard work, but the more thoroughly they search all points to right and left of the road, the more do they sacrifice their mobility; and though by the exercise of great judgment, I believe that a cyclist advance guard might perform its work on active service rather more quickly than an infantry advance guard, the advantages of employing the more mobile arm for this work would be, in a large measure, discounted. In manœuvres, it is true that cyclists can often perform advance guard work satisfactorily, but they

would always be jeopardising their advance scouts in a fashion which, I take it, could hardly be expected in war. For instance, if the two men who formed the extreme point of the advance guard are instructed to ride with a blank round in the chamber, and if captured by an ambush to press the trigger as they dismount, due warning will be given to the vanguard in their rear, but when we remember what would be the consequences of such action on their part in anything but a sham-fight, I think we shall agree that there are not heroes enough, even in the Volunteer Force, who would be willing to take risks of this kind for the benefit of their comrades behind them.

I have said that a flank guard—as we generally interpret the term—cannot usefully be furnished by cyclists, but if one is careful to confine them to the roads they can at least block all the lateral roads which lead into the main road of advance. Their great speed and the very small space that a section of cyclists riding in single file will occupy upon the main road, enables them to ride forward and occupy a good tactical position in advance upon any lateral road that leads down to that upon which the column is advancing. They can remain there until the column has passed, and then mount their cycles, re-pass the column upon the main road, and repeat the proceeding. Eight or nine sections of cyclists will thus efficiently block all lateral roads in succession for a column of from three to four miles in length.

If, however, for advance and flank guard duties, we added to the cyclists a small party of cavalry, the two arms together could perform these functions, as neither of them could do so alone, and indeed, in an almost ideal manner. If acting on the flanks, the cavalry will be able to keep touch across country with the cyclists that are moving on parallel roads, and they will prevent the occupation of tactical points which command these roads, or isolate them from the main road. Similarly, a troop of cavalry acting in conjunction with a company of cyclists in advance guard work, will be able to perform the duties of drawing the coverts on each side of the road, without, in any large degree, enhancing the mobility of the cyclists, and the main body will thus be able to continue its march in absolute security without those continual halts which are inevitable if the advance guard consists of infantry only. I should indeed be sorry for a troop of cavalry that had to perform these duties for many days in succession, for one day's advance guard work once a week with cyclists would be quite as much as the horses would stand. At the same time, it would be much easier for a regiment of cavalry to detail one squadron a day for the performance of such duties in conjunction with cyclists than to perform them alone every day of the march, and the condition of the regiment as a whole, and its consequent efficiency for any demand that might be made upon it at any moment for other purposes, would be proportionately better. As an illustration, I may quote the advance of a convoy, of which I was in charge from Leith Hill to Woking in 1904. The escort to my waggons was formed of two companies of infantry, two of cyclists, and one of mounted infantry, the latter furnished by the Queen's Westminster Volunteers. During the march the cyclists, acting on the flank, were able to give the enemy—consisting of the local Rifle Clubs—all the fighting that they had any stomach for. A running fight was conducted about a mile or a mile and a half away from the convoy, and the mounted infantry served the useful purpose of

keeping touch between the cyclists and the convoy, and of occupying any tactical points in that hilly country, which were inaccessible to the cyclists as cyclists. The consequence was, that the whole energies of the enemy were directed upon the cyclist and mounted infantry fight, and the convoy was enabled to make its way through a country where every native was in arms against it almost without opposition, and, what was even more remarkable, without the knowledge of the enemy's commander, who was unable to get any reliable information as to its whereabouts.

Platitude number two is, *that cyclists cannot take their machines into action*. It should never be forgotten that while on the march they are infantry mounted on cycles, in action they become infantry cumbered with cycles. A column of cyclists on the march will take a much longer time in deploying from the road for fire action than it will take a corresponding force of cavalry or mounted infantry to do, and this, for the simple reason that the cavalryman's horse is a tactical weapon with which he can manoeuvre under fire, whereas the cyclist's machine is merely his seven-leagued boots, which give him immense strategical value on the march, but which he has to take off to come into the firing line. Similarly, in the pursuit of a retreating enemy, the cyclist is delayed because he has to go back to his machine before resuming the advance, whereas the cavalryman or the mounted infantryman can have his horse brought up to him.

Again there are partial remedies, and here I should like to enter a protest against the general theory that for safety and security cyclists on the march in the supposed presence of the enemy should be widely strung out, and, in fact, that there should be no main body at all. It is perfectly true that if the advance points come into contact with the enemy, it will not be long before the whole of the rest of the column, however strung out, will be able to reinforce the firing line. At the same time, it is essential that the commander of the party should, at the very commencement of the tactical problem, have his men well in hand. I have myself always found it pay better to have three or four parties of scouts thrown out along the road about a mile in front of my column, and to keep my main body closely locked up, than to maintain a too widely extended formation. In this way my main body is immediately available without confusion of any kind for tactical purposes. On the signal "Halt!" being given, section commanders run out and lie down alternately on the right and left of the road on a line at right angles to that road. Their men, as soon as they have detached rifles, lie down behind them in line extended to one pace. The commander of the column is then able to handle each section without shouting or fuss in the way in which the tactical situation seems to demand.

For a pursuit, the disadvantage of having to return to the machines before resuming the advance is largely minimised if sections follow each other in succession from the outer flanks of the firing line to their machines on the road, mount and so resume the advance, covered by the fire of those nearest to the road, who will be the last to follow in the pursuit. It is also quite possible to train the men to ride one cycle and lead another, and in this way the parties which are detailed to retire first are able to take with them the machines of the parties who are covering the retreat with their fire.

When I speak of a main body riding in close formation, I of course mean close formation as cyclists understand the phrase. It is

a curious fact, and at first one that is hard to comprehend, that in column of route the men in rear of a column of cyclists are forced to ride much harder than those in front. The only remedy to apply to the concertina-like tendency of a column of cyclists in undulating country is to leave intervals of from 25 to 50 yards between sections, and of from 50 to 100 between companies. The limit to the number of men who can be usefully employed as a tactical unit upon one road has come to be fixed at 500. Riding in file each cyclist occupies a distance of 3 yards, and 500 multiplied by 3, or 1,500 yards, is the limit of depth upon one road which will enable any body of infantry to be quickly deployed for action. Once the cyclist is dismounted he becomes a pure infantryman, but with this disadvantage, that his machine demands at least two yards for itself. Once more, however, it is clear that the usefulness of cyclists in the pursuit will be greatly enhanced if they are employed in conjunction with cavalry.

A further result from the confinement of cyclists to the roads is their liability to surprise, and this, whether in motion, as already described, or when halted. I have too often seen bodies of cyclists halted in manœuvres who have taken no precautions whatever against surprise. The cyclist seems to consider it beneath his dignity to use his ten toes, and commanding points on the right and left of the road are too infrequently occupied by dismounted patrols. This is a precaution which, though it of course entails a good deal of running about on the part of individual men, should never be neglected.

I consider that cyclists are most unsuitable for convoy work. The essential feature of such work is, that the flankers should move parallel with the convoy, and at such distance from it as to prevent its being fired into. As I have already explained, cyclists cannot perform this duty efficiently; they are confined to the roads, and roads, as we all know, have a habit of running, not along the tops of ridges, but at the bottom of valleys, or even in defiles. In conjunction with other arms, however, a company of cyclists can be of the greatest assistance to a convoy commander, and can save both the legs of his infantry and the sinews of his horses.

The casualties to which cyclists are liable from punctures have been greatly exaggerated by their opponents. One puncture should not delay a section at all, and the average of punctures in the roughest country would not exceed 5 per cent. The man who is unfortunate enough to suffer a puncture can repair it in five minutes, and if worse befalls his machine, he is much better off if abandoned to his fate than the cavalryman whose horse is shot or lamed.

It is supposed that a column of cyclists on the roads, coming under a heavy fire, would suffer very great loss, and that if the leading men were shot down, all those in the rear would come to grief over their prostrate bodies and machines; but experience of cyclist manœuvres leads me to the conclusion that accidents resulting from the fall of one man in the column are extraordinarily rare, and although a company of cyclists upon a white road would seem to present a target to the enemy which he could not miss, I am not certain that our South African experiences against a mounted enemy quite bear this out. How often has one "browed" into bodies of men seemingly in the closest order without hitting one of them; how difficult has it been to bring down a galloping man, even at the closest range! When we remember that the cycle presents a smaller target than the

horse, and on the road travels at twice the speed, I think we shall all agree that the cyclist is probably the most invulnerable to bullets of all the arms.

A good deal has been made of the degree to which the speed of the cyclist is dependent upon the wind and the weather. Against a very strong headwind it may be impossible for him to make more than 4 miles an hour, and in a very clayey or muddy lane, his wheels get clogged and he cannot ride at all. It is, therefore, argued that it is impossible to reckon with any certainty upon a body of cyclists arriving at any given point in time, and a staff officer will, therefore, prefer cavalry for special duties of this kind if he can get them. But if the cyclist is dependent upon wind and weather, so is every other arm, and whereas the cavalry horses, after a week of bad weather, are permanently and seriously depreciated in value, the cycle, when the fine weather returns, is as good as ever it was. General Bronsart von Schellendorf states that an infantry division, under favourable conditions, can perform a march of 14 miles in six hours, but that in bad weather and on heavy roads it would take from nine to fourteen hours to accomplish the same distance. A body of cyclists might well march 14 miles in one and a half hours, but it would be difficult in the worst of weather for it to take three and a half hours for that distance, which, as General Maurice has pointed out, is only in the exact proportion of the delayed march of the division.

These arguments do not, however, preclude the need for palliatives where possible. High physical training, good march discipline, and constant practice will as good as double the speed of a cyclist column in bad weather. Something also may be said for the use of ground. For example, if I were asked to march north from A to B over high plateau land, where a strong northerly gale was blowing, and I found it possible, by taking a circuitous route, to creep up a valley or two, where the wind was not blowing in such force, I should certainly avail myself of the valleys, more particularly if by riding north-west and then taking a tack to the east, I avoided the headwind all the way. In calculations of this sort for staffing purposes, the presence of a cycling officer on the staff, who is *au fait* with the possibilities of the bicycle under any given climatic conditions, seems indispensable. Of course, if it was only dispatch riding that was required, it would be simple enough to-day to select, in bad weather, a motor cyclist for the duty, but as I hope in a few minutes to explain, invaluable as the motor bicycle is for dispatch riding, it seems to me to be quite unfitted for anything like tactical purposes.

I now pass to the strong points of the military cyclist, and these may be summed up in the axiom that it is legs rather than arms that win battles. The superior speed and endurance of the cyclist, as compared with the cavalryman, over long distances, is unquestionable. I have already given some examples of rides which the cavalryman could not possibly perform. In 1901, the battalion to which I belong was on trek from Winchester to Swanage, which was in possession of an enemy represented by the Hampshire Yeomanry. A contact squadron of cyclists was despatched from Winchester to Swanage at 8 o'clock on a Monday morning, and by 4 p.m. had informed us at Romsey of their arrival in Purbeck Island. So little exhausted were they by this performance that they spent the best

part of the next 48 hours in lying out upon the hills and watching the Yeomanry, a report of whose every movement was sent back to the infantry column doing its poor 20 miles a day on the road. Nor is the cyclist entirely limited to the metalled road; I have successfully manœuvred four cycle companies mounted against a regiment of cavalry mounted on the grass of Salisbury Plain. Provided that there is anything like a decent surface, he can ride over any track, and even down a footpath leading by stiles across country, and in this way can often take a line which the cavalry trooper would find it difficult to make his charger negotiate. As England is *par excellence* the country of tracks and of footpaths, the ubiquity of the cyclist in England is undeniable, and when it comes to scouting, the bicycle buried under leaves in the ditch, and the cyclist in a furze bush or up a tree, denote *powers of concealment* quite unsurpassed by the cavalryman.

In 1903 I was in command of a convoy which left Aldershot on a Saturday night *en route* for Winchester. The cyclists of the battalion concentrated that same night at Andover. On arrival there, they were informed of the departure of this hostile convoy, and they were instructed to find it and hang it up. Marching with the convoy I took the obvious precaution of availing myself of local knowledge and avoiding the metalled roads. Nevertheless the ubiquity of the cyclists was such that at 7 p.m. on the Sunday night some of their scouts discovered my convoy marching through a wood in the neighbourhood of Itchen Abbas, and by 7 a.m. on the Monday morning the whole force had concentrated and surrounded my bivouac three or four miles further on. As an illustration of their powers of concealment, I will refer again to the contact "squadron" in Purbeck Island in 1901. Their presence became known to the Yeomanry because they posted a certain railway bridge in the district as "blown up," and parties of Yeomanry were sent out to find and capture them; but though they rode all through the gorse in which they were concealed, they never succeeded in seeing so much as a bicycle, in spite of the fact that all the time, as I have already explained to you, messages as to the doings of the Yeomanry were reaching the main column every two hours by day and by night.

As regards the question of equipment, I will call your attention to the cyclist corporal of my regiment now in the hall. He has had considerable experience, not only of cyclist manœuvres in time of peace, but also war in a country that would seem quite unsuitable for cyclists; he was for over a year with the Cape Colony Cyclist Corps. He is equipped as we equip the men in our own battalion for manœuvres, and as he would equip himself if he were required to come out for a month's active service at home without transport of any description, but of course in a friendly country. The only change that he would possibly make when it came to the real thing would be the substitution of wooden for steel rims; and he tells me that in the rough South African country, at any rate, the wooden rim will not "buckle," whereas the steel rim does this about twice a week. I am not sure that in addition he should not carry a revolver, though one's general experience of revolvers is that they are more dangerous to oneself and one's friends than they are to the enemy. He would always ride with his magazine charged, and with a cartridge in the breech. He is carrying 100 rounds on his person, and 50 in his valise, and spare

ammunition for his company would be carried upon a motor trailer I have heard it said that cyclists should not carry bayonets, but the bayonet seems to be returning to favour pretty generally, and if the cyclist will not have occasion for a bayonet charge on foot—and I am far from saying that he won't—his bayonet will at any rate prove very useful to him as an entrenching tool. To supplement it I think every company should carry entrenching tools and dynamite upon motor trailers. The great point, however, about the cyclist, as you see him there, is his *self-sufficiency* and his absolute freedom from the need for transport. He can feed himself on the country in which he is operating, and what is perhaps most important of all, his bicycle does not eat or drink.

The next virtue of the cyclist is his *power of rapid mobilisation*. I have already given you an instance of this in the little operations round Itchen Abbas. General Maurice has given you another in his manœuvres of 1901, and there is no doubt whatever that a hostile landing might with proper organisation be, within 24 hours, surrounded by a net of cyclist posts on every road. As we are all aware, the Volunteers are the only force in this country which could be mobilised—such as they are—in 24 hours, and there is no reason why a considerable number of military cyclists might not be despatched from their head-quarters in any direction within 12 hours of the landing of the enemy.

Of course, Sir Frederick Maurice would be the first to admit that his cyclist net is only a net, and its meshes can be broken, or at least forced back, at any point. I have two illustrations from my own experience of what happens then. At the manœuvres held by the cyclists of the Home District, under Colonel Cooper, in 1904, a cyclist net of this description was retiring upon a broad front over every road that led directly or indirectly from Borden to Hartford Bridge Flats. The company with which I was present was ordered, if possible, to break the net. We succeeded in doing so, and were able, by great good fortune, to put out of action two links or strands of it in succession; but on our arrival at Hartford Bridge Flats we found that the news of the breaking had reached all the other parts of the net, and the consequence was that an unbroken front was presented to us on our arrival at the Flats. Last May, again, the Hampshire Brigade advanced on a broad front from the line Ringwood-Southampton-Winchester upon Salisbury Plain, and was protected by a torpedo net consisting of a cyclist screen pushed out two miles ahead of each column. Our enemy—the cyclists of the Manchester Volunteer Brigade—succeeded in breaking the net near Stockbridge, but the only result was that it closed up behind them, and when they fell back in some confusion before the infantry columns two miles behind, they found themselves rather badly enmeshed in it.

The power of rapid mobilisation will of course also give to cyclists considerable value as a party to make a night or other forced march for the seizure of some point of strategical importance, such as a bridge-head, a defile, a railway junction, etc. The position can be entrenched with tools brought up on motor trailers, as I have already suggested. In 1904, at the manœuvres at which Colonel Cooper was Chief Umpire, an operation of this kind was undertaken against Colonel Godley's mounted infantry at Borden. Cyclists coming from Camberley in the morning occupied a strong position on the line of

hills to the south of Farnham; so strongly indeed that the projected advance of the mounted infantry against them proved impossible.

I have already discussed some of the difficulties involved in using cyclists for protection; but it will be obvious that if, unaided, they are unfitted for advance-guard work, *they are the ideal arm for rear guards*. The mere fact that the best position for a cyclist in retreat is the top of the reverse slope of a hill, and that his speed in riding down hill is much greater than that of even a galloping horse, will, I think, force us to admit, without further argument, that the cyclist rear guard can develop the greatest possible show of resistance, followed by the most rapid retirement to the next position. I well remember the wrath amongst my comrades in the infantry of the battalion to which I belong when, in order to enliven the tedium of a 20-mile march, the cyclists were told off to act against the battalion as if they were the rear guard of a retreating force. Although their strength was perfectly well known to the officer in command of the infantry, he was forced at every mile to deploy the whole battalion before he could in any way make it necessary for a comparatively small number of cyclists to retire. Instead of marching 20 miles that day, I should think that individual infantrymen must have done at least 30 miles.

It is generally admitted that cyclists are of great value in *outpost work as a supplement to other arms*; but in some of our longer marches in my corps we have found it imperative to spare the infantry from outpost work altogether. Necessity has therefore forced upon us the employment of the one arm which can do from 20 to 30 miles a day without unnecessary fatigue. I am probably pronouncing heretical views, but I fail to see how a small column—say 1,500 men—marching for any distance and for any length of time through hostile country, can spare nightly a sufficient proportion of its strength of infantry to secure it immunity from surprise. Cyclist posts pushed out to a radius of two miles from such a force on every road that leads to the bivouac, and in occupation of every position that commands the same, may indeed not provide absolute security in the way that an infantry outpost is supposed to do, but will at least give nearly half an hour's warning of the approach of hostile parties. I am not at all certain that for small columns of this description it will not be better to allow all the infantry an undisturbed night, and to provide merely for due and timely warning of the approach of the enemy by the use of cyclists or cavalry posts of this kind.

I have already referred to the very obvious value of cyclists as scouts; but in addition, large bodies of cyclists have great value for conducting *reconnaissances* on a large scale. The Manchester cyclists, to whom I have just referred, were able in one day to obtain most accurate information regarding the movements of columns that stretched from the New Forest to Winchester, and this information was brought in and digested so speedily that the complete report of the whole was in the hands of the Chief Staff Officer at Salisbury early in the afternoon. For a reconnaissance, it is of course invaluable to have good scouts; but if in addition, for the protection of the scouting parties, and if necessary, for driving back the enemy's screen, you have a force which, in addition to being very mobile, can develop a considerable body of fire, you have all the qualities which conduce to a successful reconnaissance. Their noiselessness and extreme speed also lend great value to *night marches* conducted by cyclists.

It is only the existence of police traps and the requirements of a too densely populated country that have accustomed us to the use of lamps at night, and it is quite possible, even on the darkest night, for large bodies of cyclists to ride without lights. For encircling the flank, or riding through a neglected point in an enemy's line, and turning up in the morning in occupation of some vital position 100 miles away from where they started, cyclists, whether they move to this position on one road, or, as would probably be better, on several, might have considerable effect. On our approach to Purbeck Island in 1901, I well remember taking part in such a night march. Just before dawn we ran into an outlying post of the enemy's cyclists, but were able by hard riding to capture them all. The consequence was that by sunrise we had struck in behind our enemy and held a position near Corfe Castle which commanded his line of retreat. As a matter of fact, the battle between the main columns resulted in the victory of the enemy, who were not therefore compelled to retreat. But our party of cyclists was in no danger of being surrounded in its turn; and I venture to think that the knowledge of the presence of an enemy, however small, upon his lines of communication would prevent even the boldest general from giving battle in his front.

The rapidity with which cyclists can thus be transferred, either by day or by night, from one flank to another or to any threatened point enormously adds to their value, and on occasion it may even be found, if it is desired to cross an unfordable river or an arm of the sea, that they are the only mobile troops that can get into the available ferries or boats.

Having now discussed the strong and weak points of cyclists when employed alone, I pass to *my main conclusion*. It is quite clear, though for some reason or other it has not yet been practically recognised, that *cyclists are strongest and most valuable when employed in conjunction with cavalry*. It would be utterly beside the mark for me to discuss at any length the comparative value of the cavalryman alone against the cyclist alone in the defence of Great Britain. Personally, I should be willing at any time to meet a regiment of cavalry with a similar number of infantry mounted on cycles; but there are many cyclist officers of experience who believe the mounted man to be the *bête noire* of the cyclist. Mr. Trapmann, for instance, of the 26th Middlesex, in his excellent little book on "Cyclists in Action," writes that in outpost skirmishes, scouting, etc., cavalry, especially where they can take a cross-country line, should invariably be able to ride down cyclists. Mr. Trapmann, however, reminds us of the important point that after a few weeks' campaigning it is hard to get any real pace out of cavalry chargers, whereas the bicycle does not necessarily deteriorate at all. In close country I do not think the cyclist has anything to fear from mounted men. Mr. Trapmann admits that the individual cyclist offers no target to speak of, and if outpaced uphill by a galloping horse can slip off his machine and become that infantryman which, as the drill-books have it, is, if he keeps cool and fires straight, a match for any cavalryman. A horseman and his horse, on the other hand, form a large target, and the horse is more vulnerable than the bicycle. The horse does not move as quietly as a man, and infinitely less so than a cyclist. Cavalry acting in large bodies on an open plain might indeed outpace cyclists; but if the cyclist chooses the right time for converting himself into a cool infantryman, he will make a cavalry charge a very risky proceed-

ing, more especially if he is sheltered by tree trunks, or walls, or is able to choose a position behind broken ground or ground covered by obstacles. When it comes to fire tactics, cyclists can employ all their rifles, the cavalryman only three out of every four.

In general, however, Great Britain is not a cavalryman's country. I am not certain that I have ever come across any country which is; but there is no doubt that the use of large masses of cavalry, as conceived on the Continent, is out of the question in the close country which is so frequent in England. Even a squadron of cavalry will be always closing up to pass through gates or gaps in the hedge or tracks through woods, and while doing so will offer perfect targets to infantry or artillery fire; and as a general rule, the cavalry in most parts of England are as much obliged to cling to the roads when on the march as cyclists. Still, whatever the comparative merits of the cavalryman and the cyclist for home defence, it is obvious that each of these arms supplies what is wanting in the other. If the cyclist can cover long distances in the day, the cavalryman can make a more searching reconnaissance. If the cavalryman is quicker at seizing any given tactical point, the cyclist, when he does arrive there, arrives with less fatigue, and can develop more fire, and presents a smaller target to his enemy. The curious thing about our trainings up to date is that the infantry and the cyclists usually train by themselves, and the Yeomanry by themselves. It is much to be hoped that when the projected organisation of the Auxiliary Forces into mobile divisions of all arms is finally realised, more frequent opportunities will be given for combined operations of cyclists and Yeomanry, not against each other, but in combination with each other. I am told that there are several regiments of Yeomanry who have realised the value of cyclists for scouting and dispatch-riding purposes, and how greatly a small proportion of cyclists in each Yeomanry regiment will save horse-flesh. For these purposes I hold that every squadron of Yeomanry should have at least six men mounted on bicycles, and having regard to the great value of considerable bodies of cyclists in support of all cavalry operations, I would even go further and urge that each Yeomanry regiment should mount one squadron of its men upon bicycles. One is of course fully aware that the Yeomanry serve a further purpose than the rôle that is or should be assigned to them in the Home Defence Army, and I am far from saying that we should reduce the number of men in this country who are being taught to ride and encouraged to keep horses. The value of the Imperial Yeomanry as a supplement to our Regular cavalry and mounted infantry in the South African war will scarcely be forgotten, and the proportion of men mounted on horses to men on foot in our Foreign Service Army is already far too small. At the same time, although I fear that such an arrangement would seriously militate against the enrolment of cyclists in the Volunteers, it seems indisputable that in addition to their present strength of mounted men there should also be a class of yeomen cyclists.

Before I sit down, perhaps I should touch upon a few points concerning the interior economy and organisation of cyclist volunteering. As I said at the beginning of my lecture, a great deal of valuable time is wasted for cyclists owing to their employment being made to subserve the interests of the infantry regiments to which they are attached. and cyclists should have frequent opportunities of being assembled in large numbers for purely cyclist manœuvres, or for cyclist man-

œuvres aided by cavalry, after the model of the manœuvres organised in past times by Sir Frederick Maurice. Colonel Cooper—whom I am glad to see here present—will bear me out when I express my sense of the extreme value of the cyclist manœuvres which take place every Easter in the Home District, at which other cyclist corps not in that district are sometimes privileged to attend; but I understand that in other parts of England the assembly of cyclists in anything like the numbers to which we are accustomed in the south is very rarely found possible.

There is one criticism which, if I may be allowed to do so, I should like to put forward as regards our Home District trainings. Possibly owing to the severity of the weather at that time of year, or more probably owing to financial difficulties, all the cyclist corps that come out at Easter are tied to standing billets. This, of course, very much militates against the reality of the manœuvres themselves, and with a force, the whole virtue of which lies in its mobility, in its independence of transport, and its power of covering great distances, I confess that I should like to see an Easter training at which two bodies of cyclists started 200 miles apart and passed the night in those places and under those circumstances which the progress of the manœuvres from day to day required of them. If there is any member of the 26th Middlesex here present, he will no doubt remind us that one of the difficulties that I have referred to, viz., that the cyclist is made the handmaid of the infantryman, would be obviated by the formation of cyclist battalions, or in country corps, at any rate, by setting apart one particular district as a recruiting area for the cyclist company and for that alone. I am not certain indeed that in the big towns separate cyclist battalions would not be the best expedient, and I am glad to hear that there are proposals afoot, at any rate, for a dépôt battalion of Volunteer Cyclists in London, which shall train the men for a certain period before returning them to the cyclist sections of their infantry battalions. But in the country corps, like those to which I belong, this system would not work at all. By excluding all districts save one from the cyclists, we should lose a large number of highly eligible men who would not enrol as infantry Volunteers; and in the selected district, on the other hand, the necessity of maintaining a full company would depreciate the high level at present maintained by the cyclists. The cyclist companies in many country battalions are the cream of their battalions, and so serve indirectly to raise the general average even in the infantry. It is true that the men are, almost without exception, the sort of men who are needed so badly for non-commissioned rank, and that the infantry is depleted of non-commissioned officers in consequence; but at the same time, there are few cyclists, as far as my experience goes, who, if not allowed to enrol as cyclists, would not shear off altogether. In most battalions I believe that this superiority of class is recognised to what I should call an undesirable degree. In particular separate cyclist messes are the custom in camp, and these messes rank in importance only after the sergeants' mess. If the full benefit of the superiority of the cyclist, both as a man and a soldier, is really to be felt in the battalion as a whole, I feel certain that the rule which we strictly maintain in our battalion of treating cyclists and infantrymen on an absolute equality in regard to such privileges, is the only sound one.

It is indeed unfortunate that the authorities have seen fit to reduce the compensation grant for cyclists from £2 to £1, but as I have already alluded to this matter, I need do no more than call attention to it as raising a very important point in interior economy. It is much to be hoped that on the principle that the Volunteer should suffer no out-of-pocket expenses, and be asked to give nothing but his time, some means may be found for restoring a compensation grant which was by no means too generous.

No paper upon cyclists in the year 1905 would be complete without some reference to the use of motor cars and motor bicycles. I believe we are to hear all about the motor cars in this hall in a few weeks' time, and I will only say as far as cyclists are concerned, first, that a motor car is a *sine quâ non* for an umpire at cyclist manœuvres, and for the commander of any considerable number of cyclists and his staff. But the motor car in the firing line is worse than a white elephant, and motorists should therefore be careful to confine themselves to discreet though invaluable work in the rear, and upon lateral and other lines of communication. In the same way a motor bicycle is not a handy thing under fire. It will not turn round quickly, and it generally succeeds in getting out of gear just at the critical moment; also in wet weather its driving band slips and its battery short circuits. It is very noisy and warns the enemy's scouts, though I have sometimes found this noise mistaken for a machine gun; but for intercommunication between the firing line, dispatch riding, etc., the economy of human energy which it effects when it does not break down makes it infinitely more valuable than the cycle. Where I think the motor mechanic might most usefully come in, is in the provision of motor vehicles for the transport of reserve ammunition, entrenching tools, repairing outfit, a cyclist field forge, ambulances, etc., and a cyclist machine gun driven by a motor would also be of great value; and I would even go further and suggest a "pom-pom," or even a light mountain gun. This motor artillery would be valuable, not so much for its actual fire effect, as for the purposes of bluff, and the doubt that it would create in the mind of the enemy as to the nature and strength of the force to which it was opposed.

The number of cyclists in the Volunteer Force at the present moment does not much exceed a total of 6,000, and what is more, this number is on the decrease. There is great variation in different corps. In my own corps we have no less than 200 cyclists on the rolls, and can accordingly always put two companies in the field. In other corps—and especially in some of the London corps—the cyclists' section consists of an officer, or non-commissioned officer, and not more than 20 men. These, however, are more often than not the corps which regard the cyclist as the handmaid of the infantry, and have either not yet realised to the full their value as a separate arm, or think that a separate arm should have a separate establishment. I should be afraid to say what is the number of persons in the United Kingdom who use the cycle, not merely as a convenience, but as their chief means of recreation, but if they were all enrolled in the Volunteer Force their numbers would greatly exceed a million men. General Maurice, as you are all aware, hopes that in the case of invasion, many of these civilian cyclists might be found to co-operate, but with regard to these, as with regard to Rifle Clubs, the first step is to get such clubs properly affiliated

to the local companies of Volunteers, and, if possible, exercised with them on two or three days in the year; and in view of what I have said on the necessity of smart drill and constant practice for valuable cyclist work, we should, I think, regard these affiliated clubs as a reserve only, to be mobilised and trained on the outbreak of war after the embodiment of the recognised Volunteers.

If the need for more cyclist Volunteers is apparent, the need for cyclist officers is more crying still. I confess I cannot quite understand why this should be. Perhaps we have not quite lived down the old ridicule under which cyclists used to lie, and I confess myself to a feeling of a want of dignity when I bicycle in uniform past the sentries at Wellington Barracks. There is also the point that the cyclist officer is very generally alone, and so misses the companionship which is so pleasant a feature of the camp training. In the day-time, and sometimes at night, he is many miles away from his battalion; if he works hard, he is seldom present at mess, and he certainly loses a good deal of the corporate life of the regiment. On the other hand, as far as instruction is concerned, the cyclist officer has all the fun of the fair. While the infantryman is on outpost duty or in reserve, or one of the rear companies in column of route, the cyclist officer gets touch with the enemy at the very beginning of the day, and keeps it up until the manoeuvres are over. He is almost entirely his own master, and has to act mainly upon his own responsibility. He is always under the notice of the generals and the umpires, and if he does useful work, comes in for quite a disproportionate amount of praise. Even in his own battalion his comrades of the infantry come to him for all kinds of information; he is eagerly questioned as to the position of the enemy, the general ideas of the day, the nature of the country, the distance to any point; he is the map, Baedeker and compass of his battalion, even though he be only a second-lieutenant. If he commands a full company of cyclists in the field, the extent of ground which they cover, and the ambitious nature of their undertaking, confer upon him the responsibilities and position of a colonel, if not of a brigadier. He is attended by a whole host of orderlies, and many is the village at which, upon arrival, he finds himself the cynosure of all eyes.

At the same time the combination of qualities required of the cyclist officer, as of the cyclist, is a rare one. He must be always cool and collected; without calmness and presence of mind his control of even a small number of cyclists becomes a farce. He must have the tactical instinct developed to a high degree; he must be able to make up his mind in a moment, and act with vigour and determination. He is always in danger, and the whole *raison d'être* of his existence is in the nature of a risky gamble. He is set tasks that no other branch of the Service could perform; if he succeeds in his mission, he accomplishes a task out of all proportion to his intrinsic value as a fighting unit; if he fails, he may even so escape scathless from the venture. He has always to be asking himself whether the game is worth the candle, and what are the odds on or against success. I hope that the reluctance of gentlemen to come forward for cyclist work is not prompted by the very just consideration that if it ever came to real warfare, the game would be almost too exciting. Whatever we may say of the usefulness of cyclists, there is no doubt that in war they would suffer losses out of all proportion to those to

be faced by any other arm; and there is the further drawback that more often than not, when the cyclist did die, he would die without glory, with no one to look on and admire, and a strong probability that his body would not be found until the war was over. As an illustration of what I mean, perhaps I may quote the following passage, in which Mr. Trapmann lays down what would be a very proper procedure for a cyclist scout:—

“Should it happen that scouts riding along a road come upon an ambushade, so carefully laid that they are only aware of it when they are practically riding through it, they should endeavour to control their surprise and show no token whatever of what they have seen. The betting is, that the enemy will allow the men to pass on unmolested, hoping to catch the main body. Once out of point-blank range he must get to whatever cover he can and give the alarm by emptying his magazine into the enemy's position. Having thus warned the column, he will, of course, have to work out his own salvation for himself.”

These are brave words, but I would ask you just to realise what such action would mean in real warfare.

Some of the more enthusiastic of us look for the day when to the Auxiliary Forces of this country will be entrusted the almost entire duty of home defence. If that day ever comes, and we see the mobilisation of complete army corps of Auxiliary troops—an Army shall we say of 150,000 from the north operating against a similar Army in the south—I will only ask you to consider how the operations might be affected if the general of one of the opposing forces were given a brigade of 6,000 cyclists, quite independent of transport, able to ride 60 miles a day at ordinary rates, and 100 miles with forced marches. I think you will agree that the state of mind of his opponent during the course of those manœuvres would entirely preclude any necessity for further lectures in this hall, for the purpose of demonstrating the strategical and tactical value of cyclists.

The CHAIRMAN (Major-General Sir J. F. Maurice, K.C.B.):—Before calling upon any of the officers present to address us, I should like to read you a letter which has been received from General Baden-Powell on the subject of the lecture. After expressing regret at his inability to be present, as he has another important engagement to fulfil, he says:—“*Cyclists for Cavalry*. They have been used some years past with cavalry in open countries (e.g., Matabeleland, 1896; India, 1897; and South Africa, 1899-1903) for dispatch riding and night scouting, and in enclosed country for both dispatch riding and scouting. A small establishment of bicycles is allowed by Government to each cavalry regiment, which I hope will shortly be increased to 40. Captain Duly's cyclists in General Plumer's column of my force did particularly good service in the late war, especially in carrying dispatches to and from Rustenburg and Pretoria, when the intervening country was in the hands of the enemy—a feat which could not have been done by horsemen. Though they cannot of course take the place of cavalry, a certain number of cyclists in each cavalry regiment are of invaluable assistance; and I believe that cyclist mounted infantry and cyclist field troops of R.E., and cyclist medical

orderlies would be of very great benefit to the cavalry brigade on service in certain countries." I am afraid that rather takes the view of the cyclist as a scout rather than the particular aspect of him with which the lecturer is concerned; but so far as it goes it is most interesting.

Colonel R. J. COOPER, M.V.O. (Commanding Irish Guards):—As my name has been mentioned by Major Johnson twice, and as I took part in the Easter manœuvres in 1904, perhaps it is only right I should be allowed to say one or two things in connection with the subject under discussion. The first point I should like to emphasise is the statement of the lecturer as to the necessity of cyclists moving in solid masses as well as having scouts in front, and the absolute importance in that way of their being able to concentrate their fire at once. The principal aspect of the subject, however, in my view is that we should not be too ambitious yet with regard to a Volunteer Cyclist organisation. We should consider the question from the point of view of their usefulness in home defence, and not look at it from any other standpoint. Having adopted that view, I think it would be a good thing to treat them as mounted infantry for home defence in the United Kingdom. Acting in that capacity, they would, in a great many ways, be able to fulfil all the conditions required of them, equal to, if not better than, other troops. I do not think we should at present consider their powers of working independently, because I think it would give rise to want of discipline and make them a very difficult body to control. The suggestion that Volunteer Cyclist units should work with the Regular cavalry is, I think, a little ambitious; but I quite see the point which has been raised of their usefulness in connection with the Yeomanry, and I think it would work. Finally, I do conceive from the small experience I had last year that, as companies of mounted infantry are largely trained as infantry to learn the discipline of infantry, so cyclists should first of all be infantry, and I do not think they should at present imagine themselves fit to act as cavalry. I think that is very important, and I think that is the basis on which we should start, whatever may come later on.

Colonel A. R. SAVILE (late 18th R.I.R. and late Professor of Tactics, etc., R.M.C., Sandhurst):—It has been a great pleasure to me to hear from Major Johnson the progress that has lately been made in military cycling, particularly as it comes from a member of a Volunteer corps of a county like Hampshire, which has done so much in the past to promote military cycling. Wherever I have been with cyclists, the Hampshire sections have been with me, and have always been prominent in smartness and good work done. It must be very pleasant to come and lecture here nowadays on military cycling without the fear of being trampled upon by the audience, as we used to be in the old days, when we had to fight for our existence, and to argue that we might be allowed to exist, for if we were only given a little longer time we would try to prove that we could do something from the military point of view. I was very pleased to find that the things which seventeen or eighteen years ago we believed we could do are exactly the things which are claimed now by all exponents of military cycling as those that can be done and are done. One of the first things I noticed to-day was the remark by Major Johnson that cyclists are not regarded as a distinct arm. I do not think there has ever been a desire to regard cyclists as a distinct arm, either by the cyclists themselves or by anybody else. Cyclists are infantry. What kind of infantry? Mounted infantry

—one form of mounted infantry. I do not think anybody can claim more or less for a cyclist than that he fulfils the function of mounted infantry, which is an infantryman given means of moving faster than his own legs can carry him, whether he goes in a cart, or on ponies, or in a train, or in a balloon, or anything you like. An infantryman is a mounted infantryman if you give him superior means of locomotion. I do not think we—as cyclists—want to be considered a distinct arm. It would be rather disastrous for Major Johnson's corps, which he says includes 200 cyclists, if those 200 men were to be considered as a distinct arm. We do not want to be anything better than mounted infantry, and I believe cyclists could do mounted infantry work on certain occasions. I do not say the cyclist is the best form of mounted infantry. He may be the best in one campaign in one country, but he may be the very worst form of mounted infantry in a different campaign in a different country. With regard to their position in line of battle, I can only say it is my belief that the greatest military authorities have decided that battalions of cyclists as mounted infantry find their place with the advanced cavalry. When I say advanced cavalry, I do not mean the advance guards of the various columns on the roads; I mean the cavalry screen, which, in Continental warfare, covers the whole of the front, and the strength of which would be wonderfully increased by the presence of infantry. The cavalry screen, as every student of history knows, has often been stopped by troops in a defensive position. Cavalry cannot turn troops out of a defensive position; they want fire power, and infantry or horse artillery must supply it. Or sometimes the advanced troops may have to hold a post for a certain time; but cavalry do not hold defensive positions. You might ridicule this if I said it was my idea, but I say that the greatest military authorities have come to the conclusion that mounted infantry (and I include cyclists in the mounted infantry) find their place with the advance cavalry. What about the battle? Where the cavalry, which has been advanced, is throughout the battle, there will the mounted infantry be also. In a lecture of this kind it is impossible for the lecturer to include in his remarks everything which he wished to say, or everything which his audience may wish to hear. What I should have liked very much to have heard from Major Johnson, and what perhaps he may touch upon in his concluding remarks, is, How are his cyclists selected? Is it well understood that the cyclist has to be a particularly good soldier, and that every man in the 1st Volunteer Battalion of the Hampshire Regiment is not a fit man to be one of the Hampshire cyclists? He ought to be a better man than the ordinary class of recruit, and he has to be still more highly trained. It is all very well to collect a number of men, to supply them with bicycles, and to say you have a cyclist infantry force. I do not call it by that name. It is a cyclist force, but it will not be able to do the duties of cyclist infantry. I consider cyclists a very delicate force—when I use the word "delicate" I use it in the same way as if I was talking of the works of a watch, which are very wonderful and beautiful to look at; at the same time they are very delicate, and so are cyclists. It seemed to me that Major Johnson rather avoided the subject of casualties. I think the knowledge that casualties are frequent, and the measures taken to prevent casualties to machines when cyclists are on the march, is one of the most important things that a cyclist commander should bear in mind. Major Johnson said that punctures are generally over-rated, and gives 5 per cent. as the average. I do not know what 5 per cent. means. Is that 5 per cent. per hour or per day or per campaign?

Major JOHNSON :—Per day.

Colonel SAVILE :—In my experience that is a low average. Even when cycles were fitted with solid tyres we had more casualties, and machines do break down in the most extraordinary manner. I think it is one of the duties of every commander of cyclists to take note every time that he rides out, of the casualties that occur to the machines. Every machine should have a number, and every casualty or puncture or anything which goes wrong with the mechanism of the cycle should be recorded. By that means an officer gets to know which of the mounts in his command are chronic invalids, which have sudden and serious complaints, and which of them are generally immune from casualties. That is a very important thing. I also think that generals, when they inspect bodies of cyclists, ought to enquire what number of casualties there have been. You have to get your men to the place where they are wanted, and not only the men must be fit, but the machines. In that connection I should like to give you a little experience of mine. At one of the manoeuvres — about the year 1888, I think it was — I remember having a most excellent machine built for me, with every military requirement, by one of the leading makers in the world. We were to start on the manoeuvres from Guildford on the way to Salisbury. We paraded in the station-yard at Guildford, which you may know is just at the foot of the hill going up the Hog's Back. I started from the White Hart Hotel, at the top of the High Street, to ride to the parade ground, and my machine broke down—absolutely irreparably—between the White Hart Hotel and the station-yard. Now, that is a thing that might happen to any machine. Just as an instance of the resourcefulness of cyclists, I should like to mention that the parade I am referring to occurred on Good Friday morning. I sent my orderly officer back into Guildford to get a machine out of a cycle shop, but I told him I must have a proper mount to go on with. He said: "I will get you one." He went up to London, took a new machine out of a cycle shop in Holborn Viaduct, to the great anger of the caretaker, an old woman who was left in charge for the day, and overtook me between Winchester and Stockbridge the same afternoon with that machine. I do not think anyone but a smart cyclist could have done that. In conclusion, I beg to express my thanks to Major Johnson for the pleasure I have derived from hearing his lecture.

Major W. BURTON STEWART (Lothians and Berwickshire Imperial Yeomanry) :—I will not attempt to speak on this occasion from any practical knowledge of cyclists used in large bodies, but I should like very much, if I may, to say a word or two on the usefulness of cyclists acting in connection with mounted troops. As a Yeomanry officer, my duty when on reconnaissance and other duties of that sort is to take care of my horses; and for the last few years, on manoeuvre days, we have also taken out a few cyclists, and the trouble, the sore backs and the sore legs which we have saved, even with a small number of cyclists, is simply extraordinary. I have consequently arrived at the opinion that every Yeomanry regiment if possible ought to have a certain number of cyclists attached to it, and I think that is Major Johnson's contention, in which I thoroughly agree. I have never approached any of the authorities on the subject, but I wish somebody who has the ear of the authorities would try and push this matter to some conclusion. Horses are very expensive and cost a lot to feed, and when you have got

them you have to take great care of them. I think the most useful part of the cyclist's work will probably be with the advanced line or advanced screen in connection with cavalry. I cannot speak of their usefulness at other points, because I have never had the opportunity of going into manœuvres with a large body of cyclists; but I can quite see that when some position has been found for them, it would be a very excellent idea if, attached to a cavalry regiment, there was a squadron or a hundred cyclists, who could at once bicycle along as fast as they could and occupy the position, allowing the cavalry screen to get on ahead. There is one point on which I am rather inclined to differ from Major Johnson in practical warfare, and that is this: He seems to think that a horse would be able to catch up a bicycle. From my experience of warfare in South Africa, and from noticing the state into which horses get after they have been a few months on a campaign, I should say the probability of a horse catching a bicycle is very small indeed. I have been very much interested indeed in Major Johnson's lecture, and I sincerely hope that something will be done in the matter, and that some encouragement will be given—especially to Yeomanry regiments—to get cyclists to join them as Yeomen, not as cyclists pure and simple.

Major J. E. SEELY, D.S.O., M.P. (Hampshire Imperial Yeomanry)*
— I am sure that this meeting, which I do not wish to detain by any lengthy remarks, would not like to separate without thanking Major Johnson for his very interesting lecture. If no one else is disposed to move a vote of thanks to him, I think perhaps I may be permitted to do so, because I had the honour to command the lecturer when he was in South Africa. It occurred to me while he was speaking that possibly his great enthusiasm for the bicycle may be due to the fact that he had two horses killed under him, and on another occasion his horse broke his neck, and that therefore he now thought it was preferable to adopt some means of conveyance which offers a less target to the enemy. However that may be, speaking as a Yeomanry officer, I entirely agree both with what he said and what the last speaker said as to the great utility of a force of cycles with every body of troops, whether it be Yeomanry, Cavalry, or Mounted Infantry. The enormous waste of horse-flesh which takes place in all peace manœuvres, and certainly in war, owing to the absence of cyclists, must have been present to the minds of anyone who has had charge of horses. Every day, whether in peace or war, the problem always is to get to the commanding position as quickly as possible. For that purpose, cycles should certainly be employed, for, as anyone who has ever commanded horses knows, it is that gallop in the morning to seize the position which does such immense harm to horses, and may involve the country in time of war in the expenditure of many millions, and in time of peace in the expenditure perhaps of many hundreds of thousands of pounds. I have no hesitation in saying that if the lecturer's suggestion were adopted and cycles were attached to every mounted force, we should save an immense sum of money to the country in the saving of horse-flesh alone. I imagine that our distinguished Chairman, whose knowledge of war is as great as ours is of peace, will agree with that statement. As to how it should be done, I do not know. Whether it would be best to enlist cavalymen or Yeomen as cyclists, or whether it would be better to attach them to their own units I leave to wiser heads than mine; but that they should be attached permanently I have no manner of doubt. Major Johnson

made several very interesting suggestions, but after all they all bear upon the possibility of getting troops of all kinds in the Auxiliary Forces to work together at their annual training. Once that can be done, once the jealousy between the Yeomanry, Volunteers, and Militia is swept away, and they work together under Army officers in combined manœuvres at each annual training, all these difficulties will disappear. I will not detain the meeting any longer, except to say that I believe I express the sentiment of everyone in this room when I thank Major Johnson very much for his most interesting lecture.

Major H. A. STENNING, 26th Rifle Brigade (Volunteer Cyclists):—As one of the original members of the Cycle corps of 1888, and as brigade cyclist officer in the Home District, this lecture has been of great interest to me, and there are several points in it which, even at this late hour, I should like to touch upon very briefly. The first point is with regard to the cyclist formation in coming down a road—what I call the disorganised formation and the organised formation. We, in the 26th Middlesex, adopt a medium between the two. We have the advanced section in the disorganised formation, and the main body in the organised formation. From the diagram that Major Johnson drew, I understood his disorganised troops did not have any advanced section at all; they simply had pairs, or, as we call them, files coming down the road. That is a hopeless sort of formation, as anybody knows who has had any practical experience of peace manœuvres. I prefer the advanced section to advance one man at a time, thus one man followed by another man at ten yards, each man taking the alternative side of the road, this gives him cover under the bend of the road. I think Major Johnson's disposition on the word "Halt," if I may say so, is a little premature, because you do not always want to spread your men out on each side of the main road; you may want them for a rush to force the enemy back at once, or reinforce the advanced section. I understood from him that he did that automatically, whether he had made up his mind to halt or not. Perhaps I misunderstood him. I have also been extremely interested in the discussion on the question of cyclists in the Yeomanry. I am delighted to see the interest which mounted men are taking in cyclists. I remember the time when they would not go within miles of them; now they want them so much that they are longing to have a few with their battalions. I am very pleased to see it. I have issued several times lately challenges to Yeomanry regiments in this district to go out and do a little Saturday afternoon fighting, and they have invariably said it was too far to go, or that the horses would not stand it, so that it has not come to much. I sent a challenge to an officer commanding a Yeomanry regiment at Seaford, and he told me it was quite impossible for him to accept it unless he worked on the top of the Downs, which were open for his men to extend upon. We cyclists naturally do not work from the top of the Downs; our work is in close country; so the fight did not come off. I hope the Yeomanry on some future occasion will be able to come down from the Downs and fight in the close country with us. We have had some very good days in the past, and I have no doubt we can offer them some good days in the future. Major Johnson did not touch much upon the question of the organisation of cyclists; the great mistake has been in raising sections consisting of twenty men and an officer, instead of raising battalions. Here in London there are only about three cyclist companies outside the 26th Middlesex (which is very weak, I am sorry to say) which can muster

anything like seventy men. The rest are sections. Every commanding officer likes to have his own cyclists; nine out of ten like to have them marching at the head of the band on their way to Hyde Park, and when they get there they say: "You are a bit of a nuisance; get behind 'The Magazine.'" That is a fact, because, as brigade cyclist officer, I am meeting with it every month, and the sooner that sort of thing is done away with the better. We want cyclist battalions; I do not say in the provinces, where the battalion is spread over many villages. One recognises that they must be handled differently. But here in London, in Liverpool, and the big towns, where there are many battalions with head-quarters in the towns, there ought not to be cyclist sections, but battalions. After seventeen years' experience I have seen no good come of the cyclist sections. Sometimes an officer is keen on them, and directly he is keen he is taken off to command an infantry company. Undoubtedly the cyclist section enlists the best men of the battalion; and there I come to the important point that not every man can be a Volunteer cyclist. We must have intelligent men, men who can read a map well, and make a sketch, and do a higher class of work which the ordinary Volunteer, at least in provincial battalions, cannot do. I think (as Major Johnson has not said it, I will say it for him) the best men in the Hampshire battalions are to be found in the cyclist companies. With regard to finance, it is a pity the Government have cut down the £2 grant to £1; but I am coming to think that £1 is good enough. I would rather have half a loaf than no bread. I should like to have the £2, of course, but I will be content with the £1, if I can keep it, but I am afraid we shall not keep it, and if we do not keep it I do not know where we shall be—there will be hardly any of us left. Major Johnson touched on the question of motor cycles, and I quite agree with him that they are not much good except for dispatch riding. I do not think they are any good except for that. With regard to the Easter Manœuvres, I quite agree with him in what he said about the standing billets. I have in hand a scheme which I hope to carry through, by which, with motor transport, vans capable of carrying a ton or two tons twelve miles an hour, we may be able next year to carry out manœuvres in which the standing billets will be done away with, and I hope to write to Major Johnson very shortly on the subject. I think motor transport must be used with cycles. Motor transport becomes more reliable every year. I have been using it largely in camp this year for working with cyclists; I had a 5-ton motor lorry, and I got 8 miles an hour out of it every day over the Sussex roads round Seaford. It was a cumbersome thing, and I ought to have had a lighter lorry, or two lorries taking a couple of tons each; but there again I was hedged in by financial considerations. The authorities only consider one 5-ton lorry equal to one horse and two mules under the present Army establishment, and only pay 30s. a day for it. As regards the machines the cyclists use, any good make of machine is good enough. Everything depends on a close inspection of the machines by the officer commanding the company or unit. We have in the 26th Middlesex a very close inspection indeed, because we give no money for compensation unless the machine has been passed by a competent board of inspectors. I believe that is the same in many corps. With regard to the number of punctures, I agree with Major Johnson that they are very much over-rated. The number is probably anywhere between 4 and 6 per cent.; personally, I do not think there is much in the question. With regard to the new machine that broke down, an old hand would never use a new machine without always fully

testing it first and giving it a good trial. With regard to the clip for carrying the rifle, there again it is six of one and half-a-dozen of another. There are several ways of carrying the rifle; what suits one machine does not suit another. If the men have their own machines, which are of different patterns, they must to a certain extent be allowed a wide limit in the selection of the carrying clip. I very cordially support Major Seely's vote of thanks to Major Johnson for his very interesting lecture. We have had a most interesting discussion on it.

Captain D'ARCY LEGARD (17th Lancers):—As a cavalryman I should like to back up Major Johnson's most able remarks on the subject of the combination of cavalry with motor cycles and bicycles; but I must protest against the narrow-minded view that he has attributed to cavalrymen, that they did not recognise the value of bicycles. I assure him that such is not the case. At the German manoeuvres, at which we were both present three weeks ago, I noticed particularly that the advance regiment of the cavalry division had a large body of cyclists on the exposed flank, and they did most excellent work. I should like to see attached to every cavalry brigade a certain number of motor cycles and military cyclists. I agree with the broad view of one of the previous speakers, that cyclists are only one other form of mounted infantry. I should wish them to form a part of every cavalry regiment—we do something in that way already, regimentally—but I should like to see the scheme more or less recognised by Government. There was one small point upon which Major Johnson laid great stress, namely, that cyclists could not take their machines into action. I would remind him that the weak point in connection with cavalry is the number of led horses. The led horses are liable to stampede, whereas cycles are not, and in that case I think he has the better of us. With regard to the duties of cyclists, I think they fit in exceptionally well if one considers that the ground that is favourable to one is unfavourable to the other. As Major Johnson pointed out, roads that are good for cyclists knock up the horses' feet; on the other hand, ground that is good for cavalry, such as downs and unenclosed country, is of no use to cyclists. The combination of the two is therefore a thing one would like to see pushed forward. It must also be remembered that at night cyclists are of great use, especially as the view nowadays is that cavalry should be withdrawn from the outposts in order to spare the horses, the value of which is exceptional, and of which the supply is limited. Finally, the difficulty that one experiences with all cavalry is their not being absolutely independent. I submit that in combination with cyclists, a cavalry brigade would be absolutely independent.

Major R. A. JOHNSON, in reply, said:—At this late hour of the afternoon I will just mention a few of the points raised by the speakers, and no more. I am exceedingly pleased that all the representatives of the mounted Army present agree with me in the main. Major Seely, Captain Legard, and Major Burton-Stewart have all supported me, and there has not been a Yeoman or Cavalryman present who has not agreed more or less. And this is very important, because I had a special warning from General Baden-Powell that I was to be very careful; shall I say—I think it is the correct expression—not tread on the toes of the cavalry. At any rate, I have not done that, I am delighted to find. When I said that cyclists could not take their machines into action, I meant this: With the cavalry the led horses are a trouble; but at the same time, I always regard as the cavalry

man's main arm, not his sword or his rifle, but his horse. That is his engine of manœuvre, that is what he strikes terror into his enemy with, that is also the means by which he gets into position. It is really where the cavalryman goes, more than what he does when he gets there, which has the great effect, I take it, upon tactics. The cyclist, on the other hand, cannot manœuvre with his machine under fire; it is not his arm at all; it is merely his seven-league boots which he uses on the road, and takes off when he comes into action. With regard to the question of motor transport, I cut that portion out in reading my paper owing to the shortness of time; but I quite agree with Major Stenning in what he said on the subject. Obviously motor transport will be used for guns, reserve ammunition, entrenching tools, and such other appliances as a cyclist acting on home defence need carry with him. Everybody is kindly disposed towards the military cyclist; the natives of the district always treat him well, and the cyclist always knows where the best places of refreshment are to be found. So I think the need for supply transport is not so great as it is with other arms, but such transport as he does carry will be carried by motor. Obviously the motor has come to stay. With regard to the reduction in the cyclist grant, I am very glad to hear that Major Stenning can do with £1. In my regiment we feel the loss very severely. As a matter of fact, a very highly-placed personage made a verbal promise to myself and to my battalion treasurer some six months ago that the grant was to come back again to us; but in my paper I have only to deal with facts, and we have not seen that grant yet! It really is rather an important point. The cyclist has for a certain number of years had £2 a year for the wear and tear of his machine, and this year this sum has been reduced to £1. In the first place, you have to equip your cyclist. As he rides a bicycle, there are certain articles of his apparel which wear out very quickly, and you have to supply him with a good many pairs of them; and there are various extras which make an equipment rather expensive. In addition to that there is his machine. It is all very well for the civilian to say: "I take my machine across country," and the rest of it; but the civilian who talks like that does not know what it is to ride with a rifle on his machine and, say, twenty or thirty, or, in serious manœuvres, forty pounds of kit also, on the machine. It is a very great strain on the machine in riding across rough country, and, under rough conditions, with all this weight, very seriously deteriorates it. We found that the old £2 grant, if it was divided into £1 a year paid to the man for the deterioration of the cycle itself, and £1 paid to battalion funds to meet the extra equipment and also to go towards paying for his travelling expenses, and so on, was not any too much; and certainly my experience in my battalion is that if we are going to lose this £1 by having the grant cut down from £2 to £1, the inhabitants of Hampshire will have to put in even more patriotism than they have done hitherto. Colonel Savile wanted to know whether the cyclist was a specially selected man, and seemed to think it was very necessary that he should be so. I do not know that we select him exactly; he selects himself. It is quite true that we tell him he has to be an infantryman first, and when he has passed out as a first-class infantry recruit, then he goes into the cyclist corps. I entirely agree with Colonel Savile, that the cyclist must be first of all an A1 infantryman and a marksman. After that we can begin to use him as a cyclist, but I do not agree that you must select him after and not before he has joined the Volunteers. Our experience is that any man who comes forward, who is properly trained, who has

the right officers, who has his heart in the right place, and who works hard enough, can be made into the quality that you require. We do not exactly select these men when they enrol themselves; they do so on the understanding that they have to do double the work of the infantryman, and that they are not to call themselves cyclists until they have passed out as infantrymen. Major Stenning referred to the desirability of confining all cyclist enrolments to special cyclist battalions in large towns. I have no experience of big towns, but it seems to me very obvious that special cyclist battalions would be the proper thing in London. At the same time, if the 26th Middlesex do not get the recruits, somebody else must get them. I do not understand how it is that there are not sufficient candidates for cyclist work, not only in the 26th Middlesex (which certainly if I was a London man I should join to-morrow), but also in the other infantry battalions. It is most extraordinary. The whole of London goes out on a Saturday afternoon on bicycles, and yet they will not join the Cyclist Volunteers. Of course, in country districts, of which I have had some experience, it would not work, because our only plan would be to box off a certain part of our recruiting districts for cyclist companies. Then we should only get a certain number of men who ride bicycles; the supply would be strictly limited. If we recruit over the whole of our area, on the other hand, there is no limit to the number of good men we can obtain. In addition, we get a very good class of man for the cyclist, the sort of man required as non-commissioned officer for the infantry, and there is always the possibility of transfer to the infantry for such purposes. I quite agree with Colonel Cooper, that it must be clearly understood that cyclists are infantry and not cavalry. It seems to me that mounted infantry are infantry, and in no sense cavalry. I think perhaps Colonel Cooper misunderstood me when he said I was ambitious in that connection. All we want to do is to co-operate with the cavalry, and by no means to pretend to be cavalrymen, which we undoubtedly are not. I must thank you very much for the kind way in which you have received this paper. I am delighted to find, first of all, that the interest in cycling has in no way gone down; and, secondly, that there is this notable advance in theory in the Regular Army, that it is becoming to be recognised more and more that in future the two mobile arms—cavalry and infantry mounted on cycles—should always act in co-operation, and that no regiment of cavalry should be without cyclists and *vice versa*.

The CHAIRMAN (Major-General Sir J. F. Maurice, K.C.B.):—I do not think there is anything for me to say, except to congratulate you most heartily, which I do with much pleasure, on the most practical discussion that I have ever heard on any subject in this Institution. The practical character has been very largely provoked by the excellent lecture to which we have all listened. If we could only get in this hall oftener as thoroughly business-like a discussion as we have had to-day, we should all rejoice in the value of the Institution for this particular purpose. Therefore, being thoroughly satisfied with the way in which you have yourselves threshed out the subject, I do not propose to do anything more than congratulate you, and to formally ask you to accord a hearty vote of thanks to Major Johnson for giving us so admirable a lecture, and for having given occasion for so excellent a discussion—a vote of thanks which has already been proposed for him by Major Seely.

THE KAISER-MANÖVER IN GERMANY, SEPTEMBER, 1905.

Adapted, with the kind permission of the Editor, by the Special Correspondent of the "Standard," from his accounts in that paper.

THE country selected for the Kaiser-Manöver of 1905 was that part of Hesse-Darmstadt which lies in the angle formed by the confluence of the Rhine and the Lahn.

The scenery on the Rhine above Coblenz is well known to every traveller, for it is at this point in his journey up the historic river that he enters the region where the long ridges of vine-clad hills, ascending at almost every mile to tumultuous castle-topped peaks, and closely hugging the river bed with their precipitous slopes, present to his delighted gaze that type of scenery which from his early boyhood he has always been taught to associate with the Rhine. The valley of the Lahn, which is not navigable, is less well known, except in the near neighbourhood of Ems—famous for its mineral springs. That river, again, is a miniature Rhine, flowing between vine-clad slopes crowned with ruined castles and rising to an altitude of from 200-300 feet above the level of the river bed.

Leaving the valley and climbing any of the winding roads which lead up from the right bank of the Rhine or the left bank of the Lahn, we find that instead of being girt with hills, as appears from below, in reality they are rivers flowing through an undulating plateau land, in gorges which are cut out to a depth of from 200-300 feet below the level of the surrounding country. This rolling plateau land is divided almost equally into arable land and woodland, populous with farmsteads and agricultural villages. While the Rhine on the W. flows almost due N. and S., the Lahn on the North flows E. and W., and the plateau land itself is divided into a series of gently sloping ridges and valleys by three streams—the Mühlbach, the Dörsbach, and the Aar, which flow parallel to the Rhine valley northwards into the Lahn. The ridges themselves are broad in expanse, and the conformations of the ground present the general features which are familiar to all English soldiers who have manoeuvred on the South Downs. To an Army barring the eastward advance of an enemy coming up from the Rhine valley below, these valleys and ridges offer a succession of admirable defensive positions, the right flank of which will rest upon the defiles of the Lahn. Metalled roads are plentiful and good, and traverse the whole country from E. to W. and in equal numbers from N. to S.

The General Idea for the operations we are about to describe was as follows:—

1. A main Red Army (imaginary) coming from France, like so many French Armies of history, has forced the passage of the Rhine at Mainz, and, having defeated a Blue Army Corps, and driven it back upon Coblenz, is marching north-east upon a main Blue Army (imaginary), which is concentrating at Marburg.

2. The Blue Army Corps (VIIIth) at Coblenz is reinforced, and ordered to operate upon the left flank of the Red advance.

Composition of VIIIth Corps (General von Deines commanding):—41st, 16th, 15th Infantry Divisions, and 25th Infantry Brigade; three regiments of cavalry, 39 batteries of artillery. In addition, a cavalry division of six regiments and two batteries of horse and two of machine guns. In all, some 30,000 men. On 11th September the 16th and 15th Divisions are on the left bank of the Rhine, the 41st Division on the right bank at Neuwied. Cavalry Division A at Neuwied and Ems.

3. The XVIIIth Corps is at Homburg, detached from the Red Army, to deal with the VIIIth Corps, and by 11th September has reached Esch, 25th Division; Idstein, 28th Division; Hahn, 21st Division; Flank Guard, Langenschwalbach; Cavalry Division B, Camberg.

Composition of XVIIIth Corps (Lieut.-General von Eichorn commanding):—28th, 21st, and 25th Infantry Divisions; three regiments of cavalry, 36 batteries of field artillery. In addition, a cavalry division of six regiments, with two batteries of horse and two of machine guns.

On 12th September the following moves took place:—

Blue.

On the 12th September the Corps with the 16th Infantry Division advanced from Hatzenport by way of Ober-Sondershausen, Dörth, the 15th Infantry Division moving from south of Coblenz by way of Udenhausen. At St. Goar and Boppard strong advance guards were thrown forward on the right bank of the Rhine, and on the night of the 13th September bridges were built. The 41st Infantry Division, moving along the right bank of the Rhine, reached the neighbourhood of Dachsenhausen, Braubach, Becheln. The Cavalry Division (A) advanced from Ems by way of Nassau, Schweighausen, on Ruppertshofen.

Red.

On the 12th September the 25th Infantry Division, moving by way of Kirberg-Schönberg, reached Kördorf; the 28th Infantry Division, by way of Panrod-Zollhaus, reached Katzenelnbogen; the 21st Infantry Division, by way of Strinzmargarethhausen, reached Laufenselden; the flanking forces reached Holzhausen; Cavalry Division (B), by way of Katzenelnbogen, also reached Holzhausen.

Observations.

This day was a day of marching and of cavalry patrols. By bringing the 41st Division, already across the Rhine, south to

Dachsenhausen, General von Deines covered the southward march of the rest of the corps, who were engaged in pontooning the Rhine at Boppard and St. Goarshausen preparatory to crossing early the following morning. The Red infantry, on the other hand, reached Kördorf, Katzenelnbogen, and Laufenselden, where they bivouacked behind an outpost line. The advanced supply depôts, which were organised for both sides by General Gallwitz, were placed beforehand in the positions reached during the evening. They consisted of stores of forage for the horses, of straw for the bivouacs, and of firewood, bread, coffee, and tinned meat for the men. The transport is mainly civilian, hired for the occasion in the district, though the civilian drivers are under the orders of men of the A.S.C. Each regiment, on its arrival at its bivouac, sends back a party to bring up one day's supplies from the supply depôt, never less than ten miles away, not in the regimental transport, which is practically non-existent, but in the wagons of the supply depôt. This system is only possible because the men carry all that they require for twenty-four hours on their backs, including a square of "*tente d'abri*" apiece, and the wagons from the supply depôts bring out nothing but rations and forage every evening, returning empty to the depôt as soon as they have discharged their freights. In this way the long lines of transport which accompany every British Army in the field are entirely eliminated from a German Army, and the divisions stand quite unhampered, with full power to develop their whole strength in the fight. The system is an excellent one, and adds enormously to effectiveness. Whether we could adopt it in England or no depends upon whether our men could carry 50 lbs. of dead weight upon their backs, and sleep without blankets and without beer. The infantryman's knapsack and the whole system of transport and supply are realities of war which are never absent from German manœuvres, and never attempted in our own.

By 10 a.m. the outposts of the 41st Division, which had started from Neuwied that morning were already in position near Dachsenhausen, and while information was being obtained by means of cavalry and cyclist patrols to the front, and by the war balloon at Dachsenhausen itself, the divisional commander was seated at the table whereon stood the telephone which connected him with General von Deines at Coblenz, and so with the other divisional commanders, on the march down the left bank of the Rhine.

The independent Blue Cavalry Division had orders to move from Neuwied and Nassau in a south easterly direction upon Ruppertshofen, a commanding position overlooking Nastätten, and the valley of the little Mühlbach.

The chief function of the vast masses of cavalry which are maintained in the German Army will be, on the outbreak of war, to cross the frontier by rapid marches, and perform the double duty of obtaining information of their enemy and of covering the concentration of the German Armies with an impenetrable screen. This was also the rôle assigned to the Blue Cavalry Division. It was probable that the Red commander would use his cavalry for the same traditional rôle. It was noticeable that despite the existence of several parallel roads, General von Katzler kept his whole division to the single winding and hilly road which runs from Nassau through Singhofen, Marienfels, and Miehlen. In the English Army, six

cavalry regiments of five squadrons would be regarded as a considerable force, and would have advanced on a front of several miles; but in Germany, six cavalry regiments are, apparently, regarded as quite a small one to be kept to one road alone. Nevertheless it seemed to us that the rapidity of the march was thus seriously hindered, and the horses unduly fatigued by the frequent checks and trotting inseparable from a column of route over a mile long. Wide patrols were, however, thrown out, and at Marienfels these came into contact with the cavalry patrols of the Reds.

The opposing patrols were soon inextricably mixed up. No single patrol retired before another — it hardly so much as took notice of the hostile parties. In many cases hostile patrols passed within 50 yards of each other, and not one, but several, parties of Red thus passed through the Blue screen, and stood in observation within 500 yards of the long column of the Blue Division. In Germany there are on such occasions no blank cartridges, no pretence, but several excellent reports to go back to the generals on either side. It is recognised that it is quite impossible without bullets to imitate the conditions of combats between small parties, and in the impossibility of providing an umpire for each party, the German Army, with great wisdom, makes no attempt at such imitations. In the matter of operations of Regiment *v.* Regiment, or Brigade *v.* Brigade, we understand that the training of the individual man in such details is carefully studied, but in grand manœuvres it would appear that the whole stress is quite rightly laid upon the actualities of war—to wit, upon the importance of boldness and rapidity in reconnaissance, and in the prompt dispatch of accurate, even though negative, information. The chances of single combats are the fortunes of actual war. But in manœuvres the Germans hold, and hold rightly, that that side of manœuvres only is valuable which is real. One noticed, indeed, many failings. The German is naturally a bad horseman, and the horses looked hardly up to their sturdy riders, with his immense additional weight of a full campaigning kit. The men were rarely, if ever, dismounted on the march, to spare their horses. On patrol duties, too, horses were not kept out of sight, and reconnaissances were never on foot. Nor was there a single instance that one could see of the employment of dismounted fire. In short, the tactics of the German cavalry are bold and offensive even to a fault, and the drill of the regiments held second only in importance to the intelligence and education of officers and men.

Ruppertshofen was reached at 11 a.m., and the Red Cavalry Division was located at Holzhausen, on the east side of the Mühlbach Valley.

By the occupation of the heights of Ruppertshofen with his cavalry, and of Dachsenhausen with his 41st Infantry Division, General von Deines secured himself on the west side of the first of the three ever-deepening valleys which, as we have said, run down northwards to the Lahn, while his enemy's outposts were located on the eastern heights behind Nastätten. As the main bodies went into bivouac, and the cavalry scouts jostled each other in Nastätten, it was clear that this and the neighbouring villages would on the morrow be the scene of a struggle for the passage of the Mühlbach Valley.

SEPTEMBER 13TH.

Special Idea—Blue.

The G.O.C. VIIIth Army Corps intends to continue the advance on the line Bogel-Emmerich and to attack the enemy.

Special Idea—Red.

The XVIIIth Army Corps will cross the line Attenhausen-Roth-Holzhausen, and thrust back the enemy wherever it meets him.

Official Narrative—Blue.

The VIIIth Army Corps crossed at 4 a.m., the 16th Infantry Division and 25th Infantry Brigade at St. Goar, the 15th Infantry Division at Boppard-on-Rhine. The 41st Infantry Division advanced to Emmerich and Pissighofen. The Cavalry Division (A) remained at first at Ruppertshofen; the 15th Cavalry Brigade pushed forward to the north-west of Oelsberg.

After concentrating at Bogel, the 16th Infantry Division advanced to the attack on Nastätten, which, at first repulsed, then renewed, put it in possession of Nastätten, and the Hollerberg. The Cavalry Division (A) at Wallmenach covered the right flank.

The 15th Infantry Division marched by way of Dahlheim-Weyer on Kasdorf.

The 41st Infantry Division advanced by Ehr-Schaarheck and the woody country east of Emmerich, fighting a winning action against the 25th Infantry Division, which was advancing by Marienfels and Geisig. During the later course of the action, the 15th Infantry Division entrenched itself at the right moment, in order to drive back over the Mühlbach the enemy (28th Infantry Division), who were already in possession of the Endlichhofer heights.

Official Narrative—Red.

The XVIIIth Army Corps advanced to the attack with the 25th Infantry Division on Marienfels-Miehlen, the 28th on the Endlichhofer heights, and the 21st by way of Nastätten on Bogel. The Cavalry Division (B) was advanced in order to surround the enemy's right flank by way of Nieder-Meilingen on Wallmenach.

The 21st Infantry Division succeeded in the first instance in driving back an attack by the enemy on Nastätten, and pushing on eastward of Bogel; but, having suffered heavy losses from the overwhelming artillery fire of the enemy, it was obliged to retire in the direction of Holzhausen, on the enemy making a renewed attack on Nastätten.

The 28th Infantry Division won the ford at Miehlen and to the south. It took possession of the Endlichhofer heights, which it held for a time, but lost to the 15th Infantry Division, being compelled to fall back on Bettendorf.

The attack made by the 25th Infantry Division, by way of Geisig, with the view of surrounding the enemy's left wing, was repulsed by the 41st Infantry Division, and the 25th Division retired on Singhofen, by way of Berg.

The Cavalry Division (B) fell back in the direction of Laufen-selden on the retreat of the XVIIIth Army Corps.

Observations.

There is one innovation, at any rate, in the adoption of which the German Army has followed the example of the British. The German Motor Volunteers were the new feature of the manoeuvres, and their organisation follows exactly on the lines of Colonel Mark Mayhew's useful corps. Even down to such details as the adoption of a khaki uniform, silver buttons, a brown leather sword belt, and a smasher hat, the two corps are practically indistinguishable. The ornamental and very useless naval dirk is the only original feature about the one Volunteer corps in all Germany. The initiator of the movement is the first colonel of the corps, Count Brandenstein, and the Kaiser himself is its principal recruiting officer. Thus it happened that the Great General Staff were quartered in Coblenz, some thirty miles from the scene of operations, to which they proceeded each morning in the cars driven by the members of the corps.

While we are upon the subject of Germany's debt to English experience, it is worthy of note that the German Army is not blind to the unsuitability of their familiar dark blue uniforms, and, above all, of their brass-bound helmets, for the conditions of actual war. The helmets, indeed, and the uncovered mess-tins flash like heliographs even on a dull day, and render an unobserved advance impossible. The Red Army Corps, however, were provided with slate-grey canvas covers for their helmets to distinguish them from the Blues, and there is little doubt that it would be thus disguised that a German Army would take the field. In wooded country the dark blue uniforms, when not given away by the burnished helmets, are, of course, sufficiently invisible; but on the light stubbles of a September morning they rendered yet more perfect the huge targets already offered to the enemy's artillery by the deep formations in lines of company column which are in vogue for the infantry of the supports. But though the blue uniform of glorious traditions will die hard in Germany, experiments are being made with other colours; in particular we noticed one battalion which was clad in a close imitation of the apple-grey and red facings of the Queen's Westminster Volunteers.

On the night of the 12th September the outposts of the opposing Armies stood facing one another on each side of the Mühlbach valley, and if the Red Army could drive the Blue 41st Infantry and the cavalry divisions out of their strong positions on the heights about Geisig and Ruppertshofen before the arrival of the 15th and 16th Blue Divisions, the Blue Army would be plunged in irretrievable disaster. By 4 a.m. on the 13th September the heads of the 15th and 16th Divisions had crossed the pontoons built during the night across the Rhine at Boppard and St. Goar respectively. By 6 a.m. all were across, the pontoons removed, and the leading battalions already on the top of the rolling plateau which leads towards the Endlichhofer heights—a performance which bears striking testimony to the war readiness of the German organisation. Arrived at Bogel, and in realisation of the sound doctrine of the offensive-defensive, the 16th Division had not been content with passively awaiting attack. Pouring down under cover of the thick fog which

masked their movements and concealed the absence of supporting columns, their right protected by the cavalry, the 7,000 men and 72 guns of this division made a fierce onslaught upon Nastätten, in the valley below them.

Met there by superior force in the nearest approach to hand-to-hand combat that mimic warfare can show, the gallant single division was thrust back up the heights again, while the Red 28th and 25th Divisions threatened its left flank, and seized the Endlicher heights and the high ground still further north, at Marienfels and Geisig. It was now the turn of the Red Army to follow up their success, while the Blue Division stood at bay, and its commander, seated at the telephone, impatiently awaited the aid of the 41st Division at Geisig and the 15th Division from the Rhine. The Blue Cavalry Division, though worsted in several charges of regiment *versus* regiment, still held his right flank secure in the woods round Wallmenach; but by 8.30 a.m. the enveloping attack of the XVIIIth Corps, in full strength, forced him to refuse his gravely imperilled left and rally to the high ground at Bogel, where the presence of the Kaiser himself seemed to bid him stand and die.

The attack of the VIIIth Corps which now followed was a surprising spectacle indeed. Possibly it was only intended as a spectacle. The thick fog, the firing line six deep, the opposing batteries standing in the open within 1,000 yards of each other, the dense masses of expectant cavalry on the flanks, the supporting battalions hastening forward with drums beating and bands playing in deep dark columns, the heavy and continuous roll of musketry, the rapid fire of 200 guns, the deafening cheers of bodies of men that charged each other in the fog, the inextricable confusion betwixt friend and foe, recalled, not an action in South Africa, or even in Manchuria, but some such Homeric struggle of the past as Inkerman. From 8.30 to 9.0 a.m. it was a veritable soldiers' battle, and the doom of the 16th Division seemed pronounced. Would or would not the 15th and 41st Divisions strike in from the north in time? A counter-attack to be successful must be made exactly at the right moment. If made too soon, it will itself be overwhelmed by the onslaught of the enemy's yet unexpended reserves. If made too late, the battle will already have been lost. There is no surer sign of good generalship than the choice of the exact psychological moment for the counter attack. That day, as at Waterloo, it was an affair of minutes only, and, as at Waterloo, a Blücher was not found wanting.

Precisely as the last columns of the attacking infantry had swung out into line on the hill leading up to Bogel, and surged like breakers on the beach against the shattered remnant of the 16th Division, the fog lifted, and the morning sun showed the whole remaining strength of the VIIIth Corps hurrying forward from Kasdorf and Emmerich on the north to strike the flank of the Red Army obliquely in decisive counter-attack. Simultaneously the hard-pressed 16th rose and charged boldly down upon the foes, now scarce 200 yards away. The grand attack of the XVIIIth Corps had failed, and they withdrew to their positions east of the little valley of the Mühlbach.

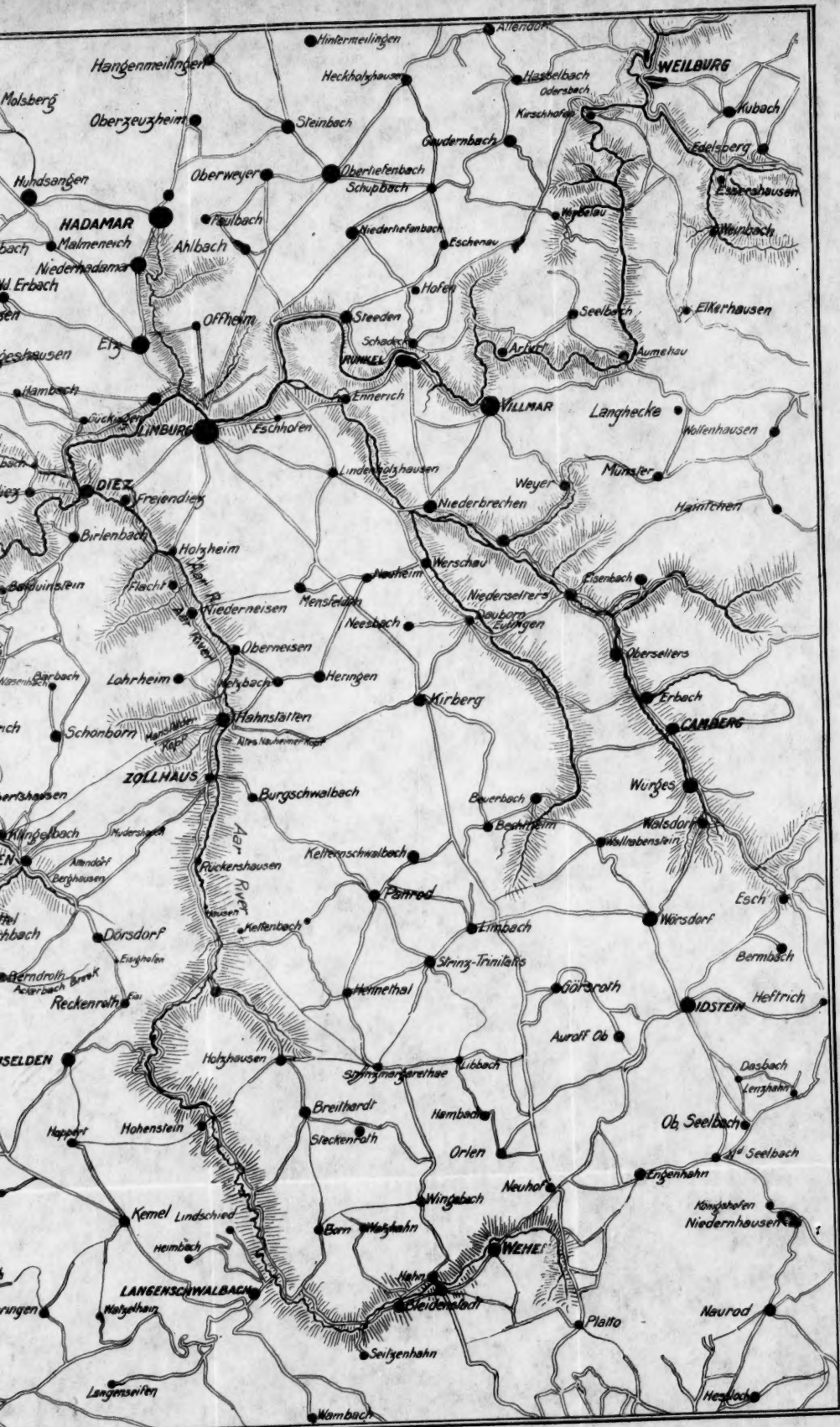
We have said that the spectacle was magnificent, and have hinted that so it was purposely intended to be. To a battle under modern conditions it bore not the slightest resemblance. The strategical moves, the larger tactics of the battle-field, the timely co-operation of the fresh divisions of the Red Army—these things were excellent,

both in conception and realisation. Of the two forces, Red, perhaps, showed the less co-operation. The attack lacked cohesion; the artillery failed too often to push forward to closer range during the advance. Even so—no English army corps is often handled half so well. The minor tactics, on the other hand, were laughable; one can hardly think that they were seriously intended to be tactics. Certain it is that no German general, save, perhaps, the Emperor himself, even pretends to imagine that formations prevailing at the battle of Bogel and the Endlichhofer heights could approximate in the very faintest degree to the formations of actual war. Extended formations are indeed practised at the earlier manœuvres of battalion *versus* battalion or brigade *versus* brigade, but at the Grand Kaiser-Manöver there is no place for the detailed instruction of the rank and file.

The first impression of the English spectator was undoubtedly one of astonishment, perhaps even of amusement. On second thoughts, however, he might be led to modify his view. It is on the face of it out of the question that so thorough and scientific a nation as Germany, so widely read and deeply reflecting a body as the German General Staff, could have shut their eyes so absolutely to the clear lessons of every war that has been fought since the introduction of magazine rifles and smokeless powder. Manœuvres are for instruction, and what instruction, it may be argued, can be obtained (even by the greatest possible exercise of imagination) from the study of minor tactics without bullets? The Germans surely hold that to anticipate the deadliness of warfare, and the confusion and dismay of the battle-field, is a sheer impossibility, and should not be attempted. Nay, more; they would maintain that to inspire all ranks with the "paramount importance of cover," as our "Infantry Training" has it, is to place the personal safety of the individual before fire effect, and to introduce a palsied caution which will bid a superior Army halt the moment that fire is opened.

We in the British Army at least know the dangers of an excessive caution, which is partly imposed upon us by our inadequate numbers. It may have been impossible to advance at Colenso; to have employed the Guards' Brigade at Magersfontein in attempting to push on where the Highlanders had failed might have meant heavy loss, but it might also have meant victory. On other occasions the risks were much less, the caution even greater, and British generals are not unknown who have preferred the canny avoidance of disaster to the possibility of a costly victory. In South Africa the sound maxim that once the attack is launched it must be pushed home at all costs was rarely, if ever, practised. An attack such as that witnessed on the 13th September was frankly impossible. In reality it would have been an affair of hours, or even days, not of minutes, and the spade would have played an equal rôle to that of the rifle. But the "methodical progression from point to point, each successive capture weakening the enemy's hold on his main position, and paving the way for a decisive advance, and each successive advance deliberately prepared and systematically carried out," which "Combined Training" tells us, is the best type of offensive battle, it was, by the nature of things, impossible to undertake at manœuvres lasting altogether but four days. Hence, all attention was concentrated upon the things which are as real in manœuvre as in war—the practice of the generals and their staffs in strategical marches, in timely co-operation, and in the proper setting out of a battle. For the rank and file it is





not surely, as some of us would have it, that the Germans have not sufficient confidence in their conscript soldiers to extend them for attack, nor that the German is naturally wanting in individual elasticity and resourcefulness. Rather it is because the German Staff believe it sufficient in grand manœuvres to impress upon their men the two greatest of the precepts of war. The first is that Armies win battles mainly by their legs, that is, by high physical fitness and long marches; next, that when the actual firing begins, the old Zulu motto is the motto of victory: "If we go forward we die, if we go backward we die; better go forward and die." And that is why the band plays in a German attack.

Having thus defended the German system of attack, a system which, it is well to repeat, attains its most exaggerated form only on grand manœuvres, we may fairly turn to the other side of the picture. The fronts occupied by the rival corps that morning did not exceed six miles, and supposing each corps to have been at its full war strength of 120,000 men, that would mean 20,000 men to a mile, or close upon nine men to a yard, exclusive of the general reserve. If the attack succeeds, well and good; there will be plenty of men to secure the positions won. But a good illustration of the dangers to which such an attack would be submitted in the event of its failure was found in the condition of the XVIIIth Corps when struck by the vigorous and well-timed counter-attack of Blue. The whole corps rose *en masse*, and descended to the valley in the very densest formation. It is true that the retirement was, in a measure, covered by the guns of the general reserve on the further side of the valley; but these were too far off to inflict much harm upon the victorious enemy, and no attempt was made in the defeated columns to render mutual aid amongst themselves by retirement in alternate parties. The long line of infantry, six or seven men deep, simply rose and turned their backs to an appalling fire not 200 yards away, while whole regiments of artillery moved slowly down in column of route. True, the cavalry here and there sought opportunities for heroic self-immolation; but the fact remains that no formed bodies could ever have survived that terrible retreat. Retirement was, in fact, impossible; no salvation could be looked for on those crowded slopes. The failure of the attack would have resulted either in wholesale surrender or in utter rout; in any case the divisions most deeply involved would have lost for ever all semblance of fighting forces.

Moreover, it seems as if the German soldier were carefully trained never even to contemplate the possibility of defeat. Certainly he is no past-master in the gentle art of effecting a strategic movement to the rear, and he is not practised in retirement or retreat. This is well illustrated by what happened on the afternoon of the 13th. At 1.0 p.m., the VIIIth Corps, after an hour's rest, dictated to them by the balloon of the umpires' staff, resumed their advance. The XVIIth Corps had already lost the heights to the east of Nastätten, and with their left flank thus turned, their resistance at Miehlen could not be prolonged. They accordingly withdrew as follows:—21st Division, Nastätten to Holzhausen; 28th Division, Miehlen, by Bettendorf, to Katzenelnbogen; 25th Division, Singhofen to Ebertshausen; Red cavalry division, Wallmenach to Laufenselden. To cover the retreat, the artillery of the retreating Army was kept in position till the very latest moment, and even beyond it. The 50th Regiment of Artillery, for instance, in an exposed position

on the slopes of the hill above Miehlen and in front of a wood, remained pounding away at the Red supports until the Red infantry emerged from the village 250 yards away and 50 feet below, and fired at them at this destructive range for fully five minutes before they even thought of going. And when they did go, it was not directly to the rear, through the numerous practicable tracks that lay through the wood, but in column of route along the edge of the wood across the front of the hostile infantry. The escort to these 36 guns was supplied by a single company of infantry, not 100 strong, and even this inadequate force made no attempt to reply to the Blue infantry until the guns had actually gone. It may possibly be urged that in reality the attacking Blues would have had no stomach for the pursuit, or that, if they had, they could never have advanced as they did over $1\frac{1}{2}$ miles of open country in something less than an hour.

Nevertheless, the Blue cavalry breasted the hill, and took up the pursuit in the woods that lay to the right and left of this road with more dash than discretion. Few scouts, if any, were out, but regiments of cavalry, riding in squadron column, endeavoured on more than one occasion to charge the retreating Reds, packed as they were in column of route upon the roads. As for the Red force, despite the absence of artillery positions in so close a country as was that which they were traversing, their artillery, with the very smallest infantry escort, was rumbling on in the rear, with frequent halts and checks imposed upon it by the large masses of infantry moving in front upon the narrow, winding road. Except by the cavalry, who also moved in close formation, no attempt was made to protect the flanks or to move on a broad front through the by no means impenetrable woods. The retreating division had scarcely so much as thrown out a rear guard. It was all crowded together upon the one country road.

Consequently, when the Blue cavalry found an open space, unless they were met in counter-charge by the Red divisional cavalry, they were able to charge home upon infantry and artillery, which were jammed together beyond all possibility of resistance. Had the Blue cavalry used dismounted fire, which, curiously enough, they never once did, the surrender of the entire division could only have been a question of time. Whatever may be the merits of the German system of attack, the experiences of the afternoon showed that it would be impossible for an Army that attacked as the XVIIIth did to get away at all if defeated.

As the sun went down, the long columns of Red were winding up the hilly roads that led to their fresh positions at Katzenelnbogen and Dörsdorf, covering the passage of the Dörsbach valley, while close upon their heels rode the pursuing Blue cavalry, now at last working in patrols, to mark and report both the line of retreat and also the eventual rallying-point of their defeated enemy.

SEPTEMBER 14TH.

Special Idea—Blue.

This morning the VIIIth Army Corps will renew the offensive.

The Cavalry Division will leave Langschied at 7 a.m. and march, by Reckenroth, on Berghausen.

16th Infantry Division will leave Nieder-Meilengen at 6 a.m. and march on Laufenselden.

15th Infantry Division will leave Buch at 6.30 a.m. and march by Holzhausen, on Dörsdorf.

41st Infantry Division will leave Miehlen at 6 a.m. and march, by Bettendorf, on Ober-Fischbach.

Special Idea—Red.

The XVIIIth Army Corps will entrench and hold the line Ebertshausen-Klingelbach-Dörsdorf-Schnepfenkopf (E. of Dörsdorf).

Official Narrative—Blue.

The VIIIth Army Corps advanced according to orders, with the intention of attacking the left wing of the enemy established behind Dörsbach, between Eisighofen and Ebertshausen.

Before the attack of the 16th and 15th Infantry Divisions could make any impression, the 41st Infantry Division advanced from the woods to the east of Fischbach and the Wolfkopf against Dörsbach in the direction of Allendorf. Its attack anticipated the simultaneous offensive by the 28th and 25th Infantry Divisions of the XVIIIth Army Corps. The 41st Infantry Division, outflanked on the left, was driven back with heavy loss in the direction of Laufenselden. The enemy, pursuing in great force, pressing still further on its left flank, came into action with the 15th Infantry Division, advancing on the line Eisighofen-Dörsdorf, and drove it also back in a southerly direction. The 16th Infantry Division, which had taken possession of the heights to the south of Eisighofen, covered the retreat of the two beaten divisions over the Aar.

The 25th Infantry Division, which had been sent from Boppard to the VIIIth Army Corps, marching by way of Nastätten, arrived at Laufenselden and caused the enemy to give up the pursuit.

The VIIIth Army Corps remained on the right bank of the Aar, south of the line Bechtheim-Kettenbach, the 25th Infantry Division being at Reckenroth.

Official Narrative—Red.

The XVIIIth Army Corps awaited on the line Ebertshausen-Eisighofen the attack of the enemy. As soon as it was clear that their left wing was advancing by Berndroth on Berghausen, the Commanding General gave the order to his right wing to assume the offensive.

The 25th Infantry Division advanced from the Kahlberg north of Klingelbach, by Katzenelnbogen, in the direction of Ober-Fischbach. The 28th Infantry Division moved by Allendorf. The enemy's left wing was driven in a southerly direction. The division pressing forward, attacked the enemy's centre (15th Infantry Division), which was itself preparing to make an attack on the line Dörsdorf-Eisighofen, and drove it also back. In the meantime the 21st Infantry Division, holding the left flank, could only with difficulty

maintain itself against the turning attack of the enemy's right wing (16th Infantry Division), and lost the heights between Reckenroth and the Aar.

Fresh reinforcements for the enemy, which were reported to be on the march from Nastätten on Laufenselden, prevented the success won by the right wing from being turned to account, and enabled the defeated enemy to withdraw over the Aar.

A report from the Army Headquarter Staff about the advance of fresh forces of the enemy north of the Lahn caused the general in command to despatch a division in the direction of Hadamar, and with the 21st and 28th Infantry Divisions, as well as the 49th Brigade, to withdraw in order to cover the fords over the Lahn into the country south of Limburg.

Observations.

The Blue Corps bivouacked upon the positions they had won; the Reds, after a march of 31 kilometres, reached their rallying point on the line Ebertshausen-Eisighofen, where they immediately proceeded to entrench. The position selected for entrenchment had a frontage of seven kilometres, but a cavalry screen was thrown cut from five to six kilometres to the front, covering 20 kilometres from the Lahn on the north to the outskirts of Schwalbach on the south.

The entrenched position itself was an exceedingly strong one. The guns and the general reserve were posted on the summit of a gradual and open slope, which for a mile and a half stretched down to the little Dörsbach below and the villages of Katzenelnbogen and Dörsdorf. The infantry constructed company trenches on the lower slopes of the hill. These were placed in lines at irregular intervals and altitudes, and seemed to vary in form and shape according to the conformation of the ground, the discretion of the company commander, or the time at his disposal. They were admirably concealed, and, being mainly constructed in potato fields and arable land, were quite invisible from below or from the wooded heights on the western side of the valley. To this invisibility an unusually wet night and a cheerless and misty dawn still further added. In advance of the general line the village of Katzenelnbogen was held by infantry, while on the south the cavalry division watched the country between the left of the position and the Aar. The line thus occupied was probably impregnable, except to an overwhelming force. Certainly it was so against the Blue Army Corps, with its almost exactly equal numbers. But it had one serious weakness, the weakness of the British position at Waterloo. Immediately behind it lay a thick woodland, traversed from west to east by a single first-class road, that which runs from Katzenelnbogen down to Zollhaus on the Aar below. What was more serious still, once the crest line was lost and the forest entered, the whole eastern slope fell by steep ravines and gullies 200 feet into the valley of the Aar. General von Eichhorn was thus standing with his back to an impassable gulf, and the loss of his last position must plunge him in irretrievable disaster. Behind the positions which he had held on the 13th on the Mühlbach the ground was generally in favour of the retreating force, but here it virtually made retreat impossible.

At 8.30 a.m. the 41st, the extreme left Division of the Blue Army, pressed forward on the line Berndroth-Berghausen, and seizing the high and largely wooded ground to the west of Katzenelnbogen, penetrated even into that village itself. General von Eichhorn's information led him to a correct interpretation of the enemy's intentions. On his left flank the 41st Division were to hold the enemy's right and occupy their attention, while the 15th and 16th and the cavalry divisions were to march by Laufenselden, and, forcing their way in between the Red left and the Aar, seize the Schnepfenkopf to the south-east of the general Red line, and roll it up from south to north. Unfortunately for the Blue commander, the 41st Division in its advance upon Katzenelnbogen had committed itself too far. Moreover, instead of appearing in front of the extreme right flank of the Reds, in reality it struck it upon their centre. The advance of the whole corps had been made upon too narrow a front, and while the Aar and the strong positions held by the Reds to the north of that river made an attempt to turn the left flank of the Reds, even with greatly superior numbers, doubtful in the extreme, on the Blue left the front of the XVIIIth Corps actually overlapped their advance. General von Eichhorn lost no time in taking advantage of his opportunities and turning the tables upon his enemy. Leaving one division only (the 21st) to hold the trenches on his left, he enveloped the advancing 41st Division with his 25th Division, and as the enemy staggered back under the blow, his central division (the 28th) left their trenches and dashed forward to complete the discomfiture of the Blue. Meanwhile the Red guns from their epaulements on the hill pounded at the discomfited Blues, thus driven in confusion obliquely across their front. The 41st (Blue) Division, staggering back across the line of their own advancing main body, carried the 15th with them in their ruin, and the Blue attack was thus frustrated before it had even begun. Thanks to the entrenchments, which had allowed him to hold his defensive line so lightly, and to develop two-thirds of his total force in offensive action; thanks also to the fact that, by entrenching, he had been able to take up a much more widely extended front than his enemy, but largely owing to the ill-timed impetuosity of the 41st (Blue) Division, General von Eichhorn was able himself to effect what his enemy had planned for him, and to roll up the attack from north to south, and thrust it back south of the Aar. A cautious general, on the British or Boer model, would have been content to await his enemy in the trenches, and would even so have beaten off the attack. Von Eichhorn, by his bold initiative, did more than repel his enemy; he inflicted a blow which would have utterly barred him from the possibility of further operations. At the same time, it may be said of him that in his own person he gave a notable demonstration of the "grand art of sitting still." During the whole of the operations he never left his table in rear of the main position, and directed the whole able development of his action, not from what he was able to see, for he could see nothing, but from the information carried to him from his divisional and brigade commanders over the telephone wires.

Tactically, too, the attack upon the Horst Wood, behind Katzenelnbogen, was a model battle. If the action of the 13th resembled Inkerman, that of the 14th recalled Wörth. As at Wörth, the

ground held by the enemy rose in terraces from the valley below, and the attacking force was thus able to utilise a quantity of dead ground in ascending the slopes. The attack was carried out in two very definite and distinct lines: a firing and a supporting line, and the advance of the first up the western was well covered by the fire of the second from the eastern side of the valley. The reserve, which came on in columns of companies in fours at varying intervals, was never employed in the attack, but on the capture of the position it passed through the first and second lines, and deployed to take up the pursuit. The entry of the 28th Division into the battle on the left of the victorious 25th was also admirably timed, and helped to repulse the cavalry charge, which was the last desperate endeavour of the Blue commander to obtain some respite for his shattered troops. Without the timely advance of the 28th Division this charge would undoubtedly have thrown the advance of the 25th into considerable confusion, and allowed the rally of the defeated Blues.

One important omission, however, could not escape the notice of the English officers who were witnesses of this most interesting engagement. The Red artillery had failed sufficiently early to realise the soundness of offensive action. Remaining in their epaulements at the top of the hill, they were too long content to play long bowls with the Blue artillery at three miles range, and it was not until the attack had been driven right home that a proportion of them limbered up to render more effective support to the infantry. Had the Blue artillery, in its turn, been handled with more dash and decision—above all, had it made any attempt, which it did not, towards the employment of indirect fire upon the assaulting infantry below—the Blue position might even at the eleventh hour have been retrieved. It is, of course, true that from a battery in motion there is no fire effect, and that a whole regiment on the move offers a dangerous target. For all that, it was a matter for surprise that, on this occasion at least, the artillery of both sides failed to practise the established German doctrine that an artillery which takes no risk in coming within decisive range, whether in attack or defence,, is an artillery which robs itself of half its terror.

At this point the Chief Umpire intervened. In order to realise the ordered plan for the final day (the 15th), the projected Blue advance was allowed to be resumed as originally planned. The Red right was withdrawn again to the trenches, and the flank attack of the Blue right, hurriedly and perfunctorily carried through in the late afternoon, was held, for the purposes of manœuvre, to have been successful. There were no lessons to be learned from this second battle, which was not intended to do more than prepare the situation for the following day. The whole advance was completed within an hour, and the XVIIIth Army Corps had accordingly to conduct a retreat under circumstances which were altogether unreal. As has already been stated, it would probably have been impossible for General von Eichhorn to withdraw at all. That he was ordered by the Directing Staff to do so, and in consequence found his whole army corps (less the cavalry division) upon a single road, was surely no fault of his. Like the Duke of Wellington, he had staked all upon a decisive victory, and he had won. The exaggerated scene upon the road down to the Aar did no more than illustrate the gravity of the risks which he had run in order to achieve that victory.

SEPTEMBER 15TH.

Special Idea—Blue.

The VIIIth Army Corps will advance this morning from the line Bechtheim-Panrod-Kettenbach-Eisighofen, and endeavour to seize the passages over the Lahn between Runkel and Diez.

Special Idea—Red.

At dawn this morning the XVIIIth Army Corps, in position between the Aar and the Wörsbach, will be prepared to deal with a hostile attack.

Observations.

On the afternoon of the 14th the XVIIIth Army Corps, in full retreat, crossed the Aar at Hahnstätten and Holzheim, and after a march of from 25 to 30 kilometres, reached their final positions on the south of Limburg, covering the passage of the Lahn. General von Eichhorn's centre was thrown across the great main road which leads from Wiesbaden, in the south, to Limburg, in the north, and the Mensfelder Kopf (altitude 300 feet), on the west, and the Nauheimer Kopf (altitude 250 feet), on the east, of that road formed the centre of his position. These two prominent *kopfs* command the whole of the plain to the south, and a line drawn through them from east to west forms the fourth side of a square, of which the Lahn, on the north, and its tributaries, the Aar, on the west, and the Wörsbach, on the east, form the remaining sides. With his flanks resting upon these two unfordable rivers, General von Eichhorn's position was again one of great strength. Meanwhile he had been deprived of his 25th Infantry Division, the heroes of the previous day, now added to the strength of the Blue side. During the evening of the 14th the VIIIth Corps, thus reinforced, had made a flank march across the Aar at Kettenbach, and, with their centre at Panrod, were to advance on the morning of the 15th in an endeavour once more to drive the XVIIIth Corps out of their positions and force the passage of the Lahn between Runkel and Diez.

The XVIIIth Corps reached their bivouacs at 11 p.m. and left them again to take up their positions on the Mensfelder and Nauheimer Kopfs at 3.30 a.m. They had thus been continuously marching and fighting for the past 96 hours, with little more than an average of three hours' sleep a day, 40 kilometres of marching daily, exclusive of fights, and but four decent meals during the whole period—on the evening of each day. Hot dinners had, during the whole course of the operations, been unavailable for everybody, more especially for those corps on outpost duty; but in the ensuing manœuvres of the Guard, experiments are to be made to this end with field kitchen wagons on the Russian model. The men had carried a weight of 50 lbs. on their backs throughout, and 150 cartridges in their pouches, and had never once so much as taken off their massive Wellington boots; and the horses of the cavalry and artillery had been fed and watered only late at night and early in the morning. The exertions of the Blue side had been even greater. Yet, by 4 a.m., every regiment was on the march again as cheerily and eagerly as if they had just left barracks, while on the Red side a large proportion

of the force had been up all night at entrenching work. The German Staff place all their confidence in the wonderful endurance and marching powers of their infantry, and anyone who witnessed the unwearied steady swing from the hips which had carried them along over those four long days must agree that this confidence is not misplaced. There appeared to be but few footsore or exhausted men during the whole period, and what ambulances there were were absolutely empty. The columns of fours were at all times, and even in manœuvre over open country, marvellously well locked up, and in the attack they always seem to arrive at a given point two or three minutes before the spectators from the English Army had calculated that it was possible for them to get there. This is the true sign of marching discipline and training; and indeed the legs of the German infantry, and their cheerful endurance in all circumstances, are nothing short of marvellous. The Staff work, too, on the Red side, was highly creditable to the organisation of the German Army. Smooth working under considerable stress, entire absence of confusion, the direction, not the leading, of their men, these will, in short, be the characteristics of the Staff work in the XVIIIth Corps. In the VIIIth Corps the same perfection had not been attained, and General von Deines himself set a bad example by trying to do the work of a sergeant-major, and attempting personally to lead every part of his force at the same time, and even in the firing line, with the result that when wanted by his subordinates he could scarcely ever be found. This general is apparently one of the few in the German Army who have not won promotion in the ordinary way. As tutor to two of the Imperial Princes, he has become a *persona grata* with the Emperor; but it is more than doubtful whether he will long continue as an army corps commander. Nevertheless, the exception proves the rule, and in its splendid infantry and its practised Staff the German Army possesses two of the most formidable of the engines of war.

The fighting on the 15th was once more a victory for the XVIIIth Corps and its able commander. Once more the Blue Army showed unmistakable signs of faulty tactical leading. Von Deines, advancing from the south, ordered three divisions to make a frontal attack, while the 16th Infantry and his Blue cavalry divisions were to turn the left of the Red position. In the intensely foggy morning the turning movement would have had every chance of success against a less able commander than von Eichhorn. Splendidly served by his cavalry patrols (in real war it is doubtful whether they would succeed in obtaining quite so much information), von Eichhorn was again aware of the turning movement before it began to take shape. He answered it, as all turning movements should be answered, by further extending the 21st Division on his left, with the consequence that the flank attack of the Blues was converted into a frontal attack. An attempt on von Deines' part to persist in his flanking movement by utilising his cavalry division only served to expose them to a destructive close-range infantry fire, to which the brigaded Maxims of the Red cavalry division gave effectual support, and the discomfited Blue cavalry gave way before the counter-charge of the Baden and Bavarian Dragoons. It is possible that von Deines might have achieved something had his cavalry divisions used dismounted fire, but the German cavalry, in grand battle at least, is taught to trust only to the *arme blanche*.

The only resource now left open to the attacking Blues was to take advantage of the widely extended defences of the enemy, and, in Napoleonic fashion, to throw the whole of their remaining three divisions into a vigorous assault upon the centre. But this movement, if attempted at all, was but feebly supported by the Blue artillery. Occupying a front of two miles, they could have made scarcely any impression upon the snug entrenchments of the Red force, whilst the Red artillery, enjoying the advantage of being already in position before the Blues deployed for attack, were able to concentrate a destructive fire upon each battery as it came up. At 11 a.m. the "cease fire" was signalled, and the Kaiser-Manöver of 1905 came to an end, but not before General von Eichhorn had commenced to set things in order for a vigorous offensive, and thus once more demonstrated his just perception of how to combine a strategical defensive with a bold and timely tactical offensive.

In the *Kritik* which followed, the Kaiser paid well-merited tribute to the marching powers of the infantry and the efficiency of the A.S.C. services; also to the valuable aid rendered by the motor Volunteers. Whether he was as satisfied with the VIIIth Corps as a "frontier" corps as he had been before the manœuvres commenced, did not appear. The verdict on this subject will be left to the consideration of the Great General and Umpire Staff during the autumn. But it is at least certain that many officers, senior and junior, in both corps will owe their accelerated promotion or their enforced retirement from the Army to the confidential reports of the umpires upon their capacity for leading men in the field. This custom of using conduct upon manœuvres as a test of efficiency in war is one which we might well follow more nearly in the British Army.

The despatch of two army corps to quarters in one afternoon is no light matter. Nevertheless, the entrainment of the infantry at the railway stations in the Lahn valley began at 2.0 p.m., and was finished by midnight, while the artillery and mounted troops were, by 4 p.m., well on their way homeward by route march. This alone is an achievement which bears striking testimony to the war-readiness of the Kaiser's Army.

It is possible that the weak spot in that Army is to be found in its systematised discouragement of individual initiative, especially in the infantry. Even the brigade commanders are allowed no scope. The Germans are not an original people; their strength lies in scientific and well-reasoned progression from data which are clearly established. The high standard of professional skill and the scientific and methodical knowledge of the Staff is a point in favour of the German Army; but the effectiveness of this genius is to strangle the initiative and resourcefulness of the individual, and to reduce him to the level of a perfectly-drilled but unreasoning automaton. The abler and the more self-sufficient the members of the Staff, the less capable do the subordinate commanders become for dealing on their own responsibility with any unforeseen emergency, for which no guiding regulations are laid down in his text-books. With the regimental and company officers the result is most striking, and there is no question that the company officers of the German Army cannot compare with our own. Questioning one of them, a captain of some forty years of age, we could get no opinion out of him either on the day's operations or on more general military subjects. Although he

was perfectly courteous—indeed, the courtesy shown to all and sundry by officers of every rank was most remarkable—“*Das weiss ich nicht*” was all that we could extract from him on any question. It may well be doubted whether a system which is calculated for success, but does not apparently contemplate the possibility of failure, and which of set purpose destroys the initiative of the individual—officer or man—might not, in the face of heavy loss, or even of disaster, break down after the silencing of the directing voice. In victory the German Army would be supreme as a machine. So, indeed was the Frederician Army. But in disaster the Frederician system, which still, in a measure, holds the field, might repeat, and for the same cause, the great disaster which no Prussian can ever forget.

A scene at a little railway station well illustrates this point. There a system, well ordered enough for ordinary days, degenerated into a scene of indescribable confusion, under the rush of some hundreds of returning spectators—whose coming should have been, but was not, foreseen. Are not the same disasters foreshadowed in an Army which concentrates all its powers in the directing hands of a small body of highly-trained but only mortal men?

The rank and file, on the other hand, at least in this part of Germany, are by no means so ground down to a dead level of soulless uniformity as one might suppose. Nor do they live so entirely in fear of the sergeant-major. Speaking generally, the men and non-commissioned officers of each battalion seemed members of a happy confraternity, bearing with imperturbable good humour the many and great discomforts of the Service, and treating each other, not as pawns, but as men and brothers. And where *landsmann* or native of any particular district met *landsmann*, distinctions of rank were almost forgotten. The hard and fast line supposed to be drawn between officer and man is, no doubt, largely broken down by the presence of the *einjähriger*, or conscript gentleman, in the ranks. But what makes for cordiality and good feeling even more is, first, the sense of a common patriotism, and, next, the implied and well-placed confidence that the whole Army reposes in its leaders.

One cannot have been present at manœuvres such as these which have been described without being immensely impressed. Perhaps one is struck most of all by the entire absence of anything like paper. The corps are real corps, the men real men of flesh and blood, and of high physique; there are no “specials” and no unfledged boys to be weeded out on the declaration of war. The equipment, too, is all there. So are the guns; so, too, are the Staff and transport. Nothing is left to be hurriedly extemporised at the eleventh hour. It is true that the VIIIth and XVIIIth Corps only stood at these manœuvres at little over half their war strength, though some of the regiments had called out a proportion of their Reserve. But even as they stood then they would be ready to cross the frontier next week, and two army corps, nearly 60,000 strong each, are formidable enough. In short, the German Army, even that part of it which is under training with the colours to-day, is all “striking force.” The “squeezed lemon” does not exist.

The organisation of supply and transport is naturally not identical in peace manœuvres and in war. For instance, the supply dépôts for the retreating Red Army had been placed beforehand in rear of the successive positions to be occupied, though the Blue dépôts seem to have been moved up in rear of the advance. But the

problem of feeding a great Army in the field remains the same in peace as in war, and in war would even be simplified by the possibility of requisition and by the prior lien upon the railways for military to the exclusion of all other traffic. In praising the organisation of the Army Service Corps and Transport under General Gallwitz, the Kaiser put his finger upon one of the strongest points in the German military system, and one of the most essential to victory in the field.

Lastly, the most impressive reflection of all is that which forces itself upon one at the mere aspect of regiment upon regiment of splendid vigorous youth. Germany gives to her Army the best of all her young manhood — reaching in education and training, physical, moral, and mental, to an astoundingly high level. Not all her population are privileged to take up arms for the country. A considerable selection is made, and the unfit are rigidly eliminated. The only thing that the modern German Army requires to make it a perfect engine of war is a little actual war experience. When that war experience comes, losses will certainly be inflicted upon the dense formations and barrack-square precision of their system of attack, which will be so appalling as to excuse all the anticipations of the German Staff and utterly destroy all their tactical conceptions. It will thus remain to be seen whether a machine which has been built up upon a calculated method of the utmost rigidity will be able to adapt itself to the altered situation, or whether, thrown hopelessly out of gear, it will only serve to precipitate the destruction of an Army all ranks of which have been taught to regard themselves as unthinking fly-wheels in a great and perfect engine, but never to rely upon their own individual powers of initiative, improvisation, and resourcefulness.

THE TACTICAL EMPLOYMENT OF PACK ARTILLERY.

By Major K. K. KNAPP, R.G.A.

THE term "pack artillery" is used advisedly instead of "mountain artillery," as the latter is to some extent responsible for the prevailing idea that mountain batteries are only useful for hill-fighting or operations in a mountainous country. That this idea is erroneous has been amply demonstrated by the Japanese in the late war, and so fully do they recognise the value of this branch of the artillery that they maintain a proportion of one mountain battery to two batteries of field artillery, and are even said to be contemplating an increase, as the result of their late experiences. Unfortunately, the lesson was not learnt at home in time to prevent the recent abolition of the mountain artillery units, which existed out of India, and the absence of all mention of this nature of artillery in the latest edition of "Combined Training" lends force to the doubt, whether the lesson has even now been fully appreciated.

It would be unsound to advocate the use of mountain guns in places where wheeled artillery can be equally well employed; but there must undoubtedly be many occasions even in European warfare when pack artillery would be of value on account of its great mobility. Batteries of guns carried on pack animals can practically go anywhere that an infantryman can go without using his hands; they can easily negotiate hills, woods, broken or close country, which would be difficult, if not impassable, to wheeled artillery, unless roads exist or passages have been previously prepared.

In the matter of concealment, too, these batteries have an advantage, for with pack animals, cover can be obtained from hedgerows, undulations of ground, thin scrub, etc., which will conceal a man standing upright, and so, in country in which such cover exists, batteries of mountain guns may often reach effective ranges without detection, where wheeled artillery could not conceal its movement.

2. Pack artillery is therefore peculiarly suited to work with infantry, and it is as the immediate auxiliary of that arm that its employment is advocated. In order to fulfil this rôle effectively, a mountain battery should form an integral part of each infantry brigade in action. Moving with the brigade reserves, these batteries would always be at hand to give the infantry close support, not only in the final stages of the engagement but throughout the fighting, and so timely assistance would be ensured to that arm whenever they require it. In short, batteries of pack artillery should be to infantry brigades what horse artillery batteries are to brigades of cavalry.

Only under exceptional circumstances, when some advantage is to be gained thereby, should these batteries be brigaded together in action, as, for instance, in turning movements when no other artillery is present and hostile artillery is likely to be met with, or during an attack, when the capture of commanding ground, such as the key of a position, necessitates the concentration of these batteries, either to assist the infantry in retaining possession of the hill, or to derive full benefit from the advantage gained by bringing as much artillery fire as possible to bear on the enemy's defences from this commanding position.

3. The tactical uses for which pack artillery is required as the immediate auxiliary of infantry are as follows:—

a. Close Support of the Infantry during the Attack.

"Combined Training, 1905" (p. 118 §6), says:—

"It should be borne in mind that the greater the difficulties of the infantry, the closer should be the support of the artillery. This may necessitate some of the artillery being pushed forward to decisive ranges during the final stages of the engagement."

And on p. 117 it is laid down that:—

"Subsequently, at the critical moment prior to an assault, when an overwhelming force is required, it (horse artillery) may be pushed forward to decisive ranges often on the flanks of the firing line to render it the closest support."

Now, the exact moment when this very close support will be required cannot be foreseen, for the time and direction of the enemy's counter-attack will probably come in the nature of a surprise, and it is then that the attacking infantry will most require immediate assistance. But in the field army as at present constituted, the infantry is dependent on batteries of horse or field artillery for their support, and it must often happen in broken or close country that wheeled artillery is unable to advance to decisive ranges, or can only do so by making a long detour on account of the difficult nature of the intervening ground. In either case the necessary support for the infantry may not be forthcoming at the critical moment, and the want of it may lead to their repulse and consequent failure of the attack.

If, however, batteries of pack artillery form an integral part of infantry brigades, and accompany them as suggested, close support will be provided throughout the attack, and these batteries would be at hand not only to assist in repelling counter-attacks, but also to confirm the advantage if an assault prove successful. This applies with particular force to a successful assault on the key of a position, which is, as a rule, commanding ground, or hill inaccessible to wheeled artillery.

Mountain batteries could be brought into action on it and assist in the development of effective enfilade or reverse fire against other parts of the enemy's position. The effect of combined artillery and infantry fire from this commanding ground would contribute far more than the unaided fire of infantry towards preparing the way for the final assault. Moreover, the enemy would not be likely

to let the key of their position pass out of their hands without making heroic efforts to recover it, and the support of guns in action there would greatly assist the infantry of the attacking force to retain possession of the captured ground.

b. In the Defence of Woods.

Woods often form important features in a line of attack or defence, as, for instance, in the battles of the campaign of Metz in 1870, and the defence of a wood may be greatly strengthened by the presence of artillery; without guns carried on pack animals, no artillery can be used, unless roads exist or there is time to clear passages for wheeled traffic. If batteries of pack artillery accompany infantry brigades, guns would be immediately available to assist in the defence of woods captured in the course of the fighting.

c. In Turning Movements in Broken or Hilly Country

wheeled artillery cannot, as a rule, be used, and batteries of pack artillery are indispensable, as the Russians learnt to their cost in the late war.

On occasion, when a division or more of the Army is employed in a turning movement, and no other nature of artillery accompanies the force, it will generally be advantageous to work the batteries of pack artillery in brigades, especially if hostile guns are likely to be met with. This applies also to cases when the turning force consists of a mixed brigade only and more than one battery is sent with it.

d. In Temporary Forward Positions by the Defence.

In reference to this, "Combined Training, 1905" (p. 126), says:—

"On suitable ground, artillery may often be advantageously employed for this purpose."

If batteries of guns carried on pack animals form part of the force acting on the defensive, the use of artillery in this case would not be limited to the same extent, as it is when wheeled artillery only is available, and the defence could so take greater advantage of forward positions commanding the ground over which the enemy will probably advance.

e. In the Counter-Attack by the Defence.

"Combined Training, 1905" (p. 131 §1), says:—

"It will generally be advantageous moreover from the point of 'moral' if some portion of the artillery accompanies the infantry and comes into action at decisive ranges."

Here the use of artillery as the immediate auxiliary of infantry is definitely enjoined, and the reasons advanced in favour of the employment of pack artillery for this purpose in the attack apply generally to the counter-attack also.

The commander of a force acting on the defensive, who has at his disposal batteries of guns carried on pack animals in addition to horse and field artillery, will have far greater latitude in his choice of ground for the counter-attack than the commander of a force in which only wheeled artillery is available.

4. In the bombardment of a position, batteries of pack artillery will be best employed in shelling the enemy's infantry, while the field and heavy guns engage the hostile artillery; but if it is necessary that these batteries should co-operate in the endeavour to silence the enemy's guns, then they can do so with most effect when employed as the immediate auxiliary of the attacking infantry. For it is one of the results of the introduction of smokeless powder and Q.F. equipments that a force acting on the defensive has now the power of refusing to disclose its position until compelled to do so by the approach of the attacking infantry within effective range.

"Combined Training, 1905" (p. 119, sec. 120), reads as follows:—

"It will be the first task of the infantry to push forward a firing line of sufficient strength to draw the fire of the defence, and thus find a target for the artillery; for the defenders, unless thus threatened, will be careful not to expose themselves, and consequently the attacking artillery will produce no effect."

In the future, therefore, it will generally happen that the bulk of the artillery on both sides is not employed, till the infantry has advanced to effective range and so forced the enemy to disclose his position. The batteries of pack artillery, which accompany the infantry brigade reserves, will by then be in action at effective ranges, and the bombardment of the enemy's infantry can be carried out by them simultaneously with the bombardment of the hostile guns by the field and heavy artillery.

If, however, it prove necessary for the attacking force to employ all available guns in engaging the hostile artillery, the batteries of pack artillery, being in action at effective range, can lend material assistance to the field and heavy guns, notwithstanding a comparative weakness of shell power. They may also from their forward position get opportunities of enfilading portions of the enemy's artillery, and the actual and moral effect of their fire will so be greatly enhanced. As soon as a decided superiority is established over the hostile guns, the fire of the batteries of pack artillery should be turned on to the enemy's infantry positions, so as to complete as expeditiously as possible the preparation for the assault.

When the bombardment of the enemy's infantry positions becomes the special work of batteries, which move in close support of the infantry brigades, fear of the attack being launched against the enemy's position before the hostile infantry has been subjected to the demoralising effect of shell-fire will be minimised. This has been a common mistake in the past, which has many times led to failure of the attack, as for instance at the battle of Gettysburg in 1863. If the fight opens with an artillery duel, the batteries of pack artillery will be best employed in the same manner, for the infantry will push forward to effective range under cover of the fire of the field and heavy guns, and these batteries should accompany them and not take part in the bombardment, till they can come into action at effective range.

5. Even though no mountain batteries are maintained out of India, some mention of the tactical employment of mountain artillery should be included in "Combined Training," for it is the official text-

book used by the Army in India. On p. 117 of that book are specified various natures of artillery, which are used in the field, and the respective rôle of each, and to these should be added the following definition of mountain artillery:—

“Mountain artillery is the weakest in shell power, but the most mobile form of artillery. It is peculiarly suited for operations in close, broken, or hilly country, and as it can move over the same ground as the infantry, is best employed as the immediate auxiliary of that arm.”

The expression “most mobile form of artillery” is used, as mobility means power of movement rather than speed of movement, and a nature of artillery that can move over almost any kind of country is therefore more mobile than faster moving natures, which are confined to movement over ground suitable for wheeled traffic.

The definition of “horse artillery” should be altered, so as to read:—

“Horse artillery is weaker in shell power than field artillery, but more mobile; it is therefore best employed with mounted troops in advance or on the flanks, etc.”

The rest of the paragraph might be omitted when mountain batteries are added to field armies and allotted to infantry brigades during an action.

6. The tactical employment of pack artillery, as the immediate auxiliary of infantry necessitates the addition of mountain batteries to the field army in the proportion of one battery to each brigade of infantry, i.e., at the rate of one brigade of three batteries per division. This proportion can, however, be reduced in an army corps of three divisions by placing these brigades in the corps artillery, for one of the three divisions is always kept as a reserve to the other two, and two brigades would therefore suffice to give one to each of the leading divisions during operations.

The force of artillery now allotted to an army corps of three divisions consists of:—

	Guns.
2 brigades of field artillery in each division - - -	108
1 „ „ (howitzers) in corps artillery	18
1 „ „ horse artillery „ „	12
1 „ „ heavy „ „ „	12
	—
	150

The proportion of guns is thus about 6 per thousand rifles, and two brigades of pack artillery can only be added if an equivalent amount of field artillery is withdrawn; this will necessitate a redistribution of the remaining four brigades as follows:—

	Guns.
1 brigade of field artillery in each division - - -	54
1 „ „ „ in corps artillery - - -	18

With the addition of batteries of pack artillery the necessity for the brigade of horse artillery will cease to exist, and a second brigade

of heavy artillery may with advantage be substituted for it. The artillery in each army corps will then consist of:—

	Guns.
1 brigade of field artillery with each division -	54
1 " " in corps artillery -	18
1 " " (howitzers) " -	18
2 " mountain artillery, in corps artillery, but allotted to two leading divisions -	36
2 " heavy artillery in corps artillery -	24
	—
	150

Each of the leading divisions will then have one brigade of field and one brigade of mountain artillery, and as the corps commander has at his disposal the brigade of field artillery with the third or reserve division in addition to the one in the corps artillery, he will have a reserve of two brigades of field artillery, with which he can at any time increase the divisional artillery of each of the two leading divisions by a second brigade, and it will be convenient, if the brigade of field artillery with the corps artillery be generally placed with the third or reserve division.

The usual distribution of the artillery with an army corps on the march during operations would thus be:—

1 brigade of field artillery	} with each of the two leading divisions.
1 " of mountain artillery	
2 " of field artillery, with the third or reserve division.	} with corps artillery.
1 " " (howitzers)	
2 " of heavy artillery	

The addition of the second brigade of heavy artillery provides the corps commander with sufficient to reinforce the artillery of each of the leading divisions with a brigade of this nature when necessary, and so compensates for the loss of shell power, consequent on substituting 2 brigades of mountain for 2 brigades of field artillery.

If the brigade of horse artillery is withdrawn from the artillery of an army corps, it is a matter for consideration whether it would not be advisable to add a second brigade to the strength of a division of cavalry. At present the divisional artillery is obtained by taking the horse artillery batteries from the brigades of cavalry; but as the cavalry will generally be working independently ahead of the Army, it would seem wise to leave these batteries with the cavalry brigades, and give the division commander an additional brigade of horse artillery as his divisional artillery. This would form a reserve, the need for which may easily arise. As a cavalry division consists of 4,000 fighting men, two brigades or 24 guns would give a proportion of 6 guns per thousand men, instead of 3, the existing proportion, which, under modern conditions, seems insufficient for a mounted force, which must often be independent of other immediate support.

7. Under the above proposals it would be necessary to maintain two brigades of pack artillery with the Home Army for the force held ready at Aldershot; at present there is not a single mountain battery available, as those which existed have lately been disbanded.

In India a greater proportion of mountain artillery would be required with an Army engaged in a big campaign across the north-west frontier, for some portions of the theatre of war are far more

suitable for the employment of mountain artillery than of field, and an Army operating there would require more of the former nature of artillery than the latter.

Take for instance the country north of Kabul, through which invading armies have so often found their way to India in the past; the route which these armies followed runs from Mazar-i-Sharif *via* Haikab, and the passes through the Hindu Kush, north-west of Bamian to Kabul, and thence *via* the Laghman and Kunar valleys through the hills north of Peshawur to India. Operations in that part of Afghanistan would offer little opportunity for the employment of field artillery, and to oppose the advance of a hostile army mountain artillery would have to be extensively used. In order, then, that sufficient of this nature of artillery may be available for the extra requirements in certain parts of the theatre of war, where the Army of India may have to fight, it is advisable to maintain a brigade of mountain artillery for each of the nine divisions of that Army. Twenty-seven batteries would thus be required, in addition to about six that are needed for internal defence, or a total of thirty-three batteries. At present the amount of mountain artillery in India falls far short of this, for there are altogether eighteen batteries, of which only eight are British.

The provision of a sufficiency of mountain artillery, both at home and in India, seems therefore a matter for urgent consideration. Other great Powers have already turned their attention to this, and it is probable that Russia, after her recent experiences, will take immediate steps to provide a large and efficient force of mountain artillery, so that her armies may be adequately supplied with this nature of artillery when she proceeds to develop her plans for an advance on India, which have been maturing for years.

A GERMAN COLONIAL CAMPAIGN.

THE OPERATIONS AGAINST THE BONDELSZWARTS AND
HEREROS FROM THE BEGINNING OF OCTOBER, 1903,
TO 31ST JULY, 1905.

Compiled by the 2nd Bureau of the French General Staff.

Translated, by permission of the French Minister of War, from the
Revue Militaire des Armées Etrangères.

Continued from January JOURNAL, p. 97.

THE choice of the Emperor fell on General von Trotha, who received the exclusive control of all the operations in South-West Africa, Colonel Leutwein being responsible for the civil administration of the Colony only.

It was decided to substitute for the heterogeneous elements, which had up to the present maintained the campaign, a homogeneous and properly officered Expeditionary Corps, provided with all the necessary auxiliary services.

This Expeditionary Corps consisted of:—

- a. The *état-major* of the general commanding the troops, that is, the six officers of the staff; an escort; a detachment of optical signallers; a detachment of wireless telegraphists; a commissariat unit; a medical unit; a Provost-Marshall's department; and some chaplains.
- b. A mixed brigade of two regiments of mounted infantry;¹ two groups of horse artillery,² and two detachments of machine guns.

¹ The 1st Regiment (3 battalions, of which two had 4 companies, and one 3) was constituted out of the units in the Colony at the end of April, exclusive of the Marine battalion, of which two companies, owing to typhus fever, were in quarantine at Otjihaëna, and the other two on *etappen* service.

The 2nd Regiment (provisionally 8 companies strong; two battalions of 3 companies, and one of 2) formed out of the old 3rd Company of the Protectorate troops, and 7 new companies.

² The 1st group comprised 5 batteries (one a mountain battery); the 2nd group, 2 batteries (provisional).

- c. Some Dépôt units (2 companies *per* infantry regiment, 1 battery *per* group).
- d. An *etappen* service, consisting of *etappen* troops (provisionally the 2nd and 3rd Companies of the Marine battalion); a field-telegraph detachment; a commissariat service, with field bakeries; a Detachment¹ of five supply columns; station hospitals,² and different dépôts (artillery, clothing, and equipment, medical, remounts, etc.).

"It is not tactical considerations," writes General von Francois, "which are responsible for this distribution of regiments. The three or four battalions of the same corps will be the most part of the time broken up and distributed over such an extent of country that they will never take a combined part in the same action. The commander of the regiment will have far more the work of an inspector than of the head of a corps, and he will be a valuable intermediary for the Commander-in-Chief. The troops must be organised so that they can easily be grouped together, small detachments having each at its disposal the necessary resources for enabling them to act independently for a long time, whether in a stationary camp or on the march. The *personnel* of each unit must then include work-people, who can mend clothes, and arms and equipments, masons, gardeners, smiths, wheelwrights, bakers, etc.; each isolated detachment, however small it may be, ought to have its medical *personnel*, and must be provided with heliographs and signallers, if it is to co-operate with other detachments."

The mounted company comprises 6 officers, 1 doctor, 1 veterinary surgeon, 25 non-commissioned officers, 152 men, 8 wagons,³ 30 native drivers. It is the tactical unit *par excellence*; its effective being sufficiently small to enable it, in the central part of the Colony, to carry out the most part of its itineraries without having to fear a want of water; it is sufficiently strong, on the other hand, if reinforced by an artillery section, to allow of its being detached without danger of being annihilated.

The battery consists of four guns, and has 5 officers, 20 non-commissioned officers, 113 men, 100 mules, 123 horses, 4 ox-wagons, 15 natives, and 80 oxen. Each gun is drawn by from 6 to 10 horses

¹ The Detachment of 5 supply columns (*Proviand Kolonnen-Abtheilung*) has an effective of 831 officers, non-commissioned officers and men. Owing to growing needs, and to the troops being at a distance from the railway, the number of these Detachments was successively raised to three; two Detachments of Auxiliary Convoys are to be organised later on.

² Independently of the station hospitals installed in ships or in huts, the medical service comprised some field-hospitals (2 tents, 30 beds, *matériel* and medical stores) which worked in the immediate vicinity of the troops.

³ The ox-wagons, drawn by from 18 to 20 oxen, carries at least 2,000 kilos. (4,408 lbs.). In order to determine approximately the number of wagons which ought to follow a troop we may reckon one wagon for 25 men.

or mules. The foremost team consists generally of two horses, the hinder ones of mules.¹ The men are armed with the carbine.²

The battery is organised in such a way that each of the sections is self-sufficing, whether in stationary camps, on the march, or in action. In South-West Africa, as a matter of fact, the method of employing artillery in sections is common, sometimes because it is wanted to reinforce a detachment by a single section, sometimes because the difficulties of the country or the extent of the enemy's front render it necessary to break up the battery. This dispersion is, moreover, without danger, so long as the Hereros do not possess artillery. The machine-gun detachment is composed of 6 machine-guns.

At the beginning of May, Colonel Leutwein had at his disposal as a field force, 11 companies, 6 batteries, a detachment of machine guns, with a half-company of Witbois and Bastards. A part of these effectives (4 companies, 1 field battery, 1 mountain battery, and a half-company of natives) was at Otjosasu under the orders of Major von Estorff; the remainder were *échelonné* along the railway. The degree of preparation of these units was also very different; whilst the ones, which had already taken part in the operations of the preceding month, had only to complete their effectives and supplies, the others, formed with the 2nd Contingent of Volunteers, had to organise right through. All the difficulties which had been encountered during the preceding month of March, in constituting the Principal Detachment at Okahandja, now repeated themselves anew. It was not until thirty-eight days after their landing that the 2nd Contingent of Volunteers was in a position to participate in the operations.

Colonel Leutwein, on the other hand, had not waited for this date before setting in motion the first of his units which were ready; on the 4th May the von Estorff detachment had been moved eastwards towards Okamatangara, and on the 9th Lieutenant von Zülów had received orders to move with 1 company, 2 guns, and 4 machine guns, by Outjo on Grootfontein, which had been held by Lieutenant Volkmann with about 25 men since the commencement of the insurrection. Numerous reports had shown, as a matter of fact, that the Hereros were abandoning little by little the region which they had so vigorously disputed with the Germans on the 13th March, 3rd, 9th, and 13th of the preceding April, and were concentrating in force in the neighbourhood of the Waterberg. Colonel Leutwein had formed a plan for attacking them on three sides at once, from the South-East, South-West, and the North. The despatch of troops to Okamatangara and Grootfontein had for its object the placing of detachments to the South-East and the North.

In consequence of the difficulties due to want of water, in provisioning, the bad state of the horses, and finally the ravages caused by typhus, Major von Estorff took 19 days to cover the 160 kilometres (100 miles) between Otjosasu and Okamatangara; after waiting some days at this last point, he resumed his march on Okonsondusu, which he reached on the 8th June. He had had no fighting of any

¹ This seems to be the best way of utilising the means at disposal, the horse being more manageable, and the mules hardier and more capable of standing fatigue.

² At home the gunners are armed with revolvers.

importance, but fever and typhus had deprived him in a month of the tenth part of his effectives.

On the 8th June, Colonel Leutwein was at last able to concentrate at Otjosasu a detachment of 4 companies, 3 batteries, 80 Witbois, 46 ox-wagons, ready to advance in the Owikokorero-Otjire direction. The Witbois struck their camp first, and moved by Otjire and Erindi-Otjikurare on the Omuramba-u-Omatoko Valley, where they effected a junction on the 19th June with Major von Estorff. The other units followed by *échelons* from the 8th to the 11th June. The necessity for the first *échelons* having to arrange the halting places with due regard to the water supplies on the route to be followed by the main body—which comprised 2 companies, 2 batteries and the greater part of the wagons—and the inexperience of the men, with the imperfect training of the draught animals, rendered the march particularly slow and laborious; it took 10 days to cover the 65 kilometres (40½ miles) between Otjosasu and Owikokorero, and it was only on the 18th that the last units of the column reached this water point, where they received orders to halt.

General von Trotha, who arrived in the Colony on the 11th, and took over the direction of the operations, now provisionally suspended the movement on the Waterberg; while Colonel Leutwein, relieved of his command, returned to Windhoek.

The new Commander-in-Chief did not abandon the plan of his predecessor, but he considerably modified the measures taken for its execution. Believing that the converging action of three detachments on a woody country with a circumference of 150 kilometres (94 miles) would not prevent the Hereros from escaping, where, when and how they pleased, he judged it better to have more numerous, if less strong, detachments; the effective strength, however, of each of these was sufficient to allow of their driving back into the interior of the circle of investment any body of the enemy which might attempt to break out. The experience of the preceding months had shown that three to four mounted companies, supported by artillery and machine guns, constituted a fighting unit at once strong and handy, and equal to any duty. The first care of General von Trotha then was to form, with the Estorff column, the principal column, and with the companies left at Okahandja, three detachments of approximately equal strength, comprising the first (von Estorff), 3 companies, 1 battery,¹ a detachment of machine guns, and a half-company of Bastards; the second (von der Heyde), 3 companies and 2 batteries;² the third (von Glasenapp), 3 companies, 2 batteries,³ a detachment of machine guns, and a half-company of Witbois. With

¹ The 1st, 2nd, and 4th Companies of the 1st Regiment, the 3rd Battery, the Saurma detachment of machine guns; a total of 26 officers, 247 rifles, 4 guns, and 4 machine guns.

² The 5th, 6th, and 7th Companies of the 1st Regiment, the 4th Battery, and 2nd Mountain Battery; in all, 22 officers, 164 rifles, and 8 guns.

³ The 9th, 10th, and 11th Companies of the 1st Regiment, the 5th and 6th Batteries, the Dürr detachment of machine guns; in all, 20 officers, 219 rifles, 8 guns, and machine guns.

the 8th Company at Omaruru, and the detachment Volkmann,¹ which was sent to Grootfontein by Otawi, these were all the forces he could dispose of for the present. Finding these forces insufficient, General von Trotha resolved to await the arrival of the 2nd Regiment before taking the offensive.

In the last days of June, the situation was as follows:—The detachment von Estorff at Osombu-Karupuka, the detachment von der Heyde at Okosondusu, the detachment von Glasenapp at Otjire. The *etappen* line Otjosasu-Onjatu was held by the 2nd Company of the Marine battalion; that of Karibib-Outjo by the 3rd Company of the same battalion. The two other Marine companies were in quarantine at Otjihaëna. Captain Franke, with a company and two guns, policed the Omaruru district, still incompletely pacified. Garrisons of various strength (12 to 150 men) occupied important localities. The railway-guards (posts of 4 to 10 men) were distributed along the line from Swakopmund to Windhoek, and with them some 200 men of the railway troops, whose duty was to help in the working and repairs of the lines. The construction of the line from Swakopmund to Otawi, was, at the same time, being actively pushed on; towards the end of July, the rails had been laid for the first 30 kilometres (19 miles).

A careful examination of the situation showed General von Trotha that the reinforcements expected in the early days of July would not raise the Expeditionary Corps to a strength sufficient to permit of its effectively occupying the conquered country, while at the same time carrying on active operations. He demanded, therefore, from home the despatch of four companies and two new battalions.²

It was not until the 15th July that the first detachment of the 2nd Regiment began to arrive slowly, owing to the unfavourable conditions under which disembarkation at Swakopmund was carried on, and the difficulties of transport by the railway. During March, heavy gales had destroyed part of the mole; alongside the mole, moreover, had become silted up with sand to such an extent that the tugs which formerly were able to run alongside, were now no longer able to do so, and a double transhipment was necessary; it was then not possible, as the Grand General Staff pointed out in the Memo. of the 16th January, 1905, to send out simultaneously the troops and stores recognised as necessary, and it was considered advisable to allow a certain interval between the sailing of the different transports under penalty of seeing them accumulate at Swakopmund without being able to discharge. The output of the railway from Swakopmund to Windhoek had been much increased by the despatch of engines and trucks, and by the zeal displayed by the railway troops; but it was still insufficient, and its usefulness limited by the difficulty of supplying the engines with water over part of the route.

¹ The detachment brought to Grootfontein by Commandant von Zulöw (the 3rd Company of the 1st Regiment, 2 guns, 2 machine guns, 4 officers, and 200 rifles).

² These reinforcements, which were granted him, arrived in the Colony on the 13th and 27th August, the 11th and 24th September, and in round numbers, raised the effective of the German troops in South-West Africa to 9,000 men, including the Reservists and Landwehr.

In the first days of August, nevertheless, the reinforcements which had arrived enabled General von Trotha to create two new detachments, comprising: the 1st, under the orders of Colonel Deimling, four companies, a battery and a half, with a half-company of Béthaniens;¹ the 2nd, under the orders of Captain von Fiedler, two companies and a half-battery.² No modification was made in the detachments, von Estorff, von der Heyde, Mueller (Major Mueller had relieved Major von Glasenapp at the end of July), and Volkmann. With these 6 detachments, representing in round numbers a force of 16 companies, 30 guns, and 2 machine guns (a total of about 100 officers and 1,500 men), General von Trotha resolved to resume the offensive against the groups of the enemy reported on the southern slopes of the Waterberg.

On the 3rd August, the positions occupied were as follows:—

Detachment von Estorff	at Otjahewita.
"	von der Heyde at Omutjajewa.
"	Mueller <i>en route</i> from Otjire.
"	on Erindi-Ongoahere.
"	Deimling at Okateitei.
"	von Fiedler at Orupempaparora.
"	Volkmann at Otjenga.

The circle of investment, which, on the 15th July, was 450 kilometres (281 miles), was now not more than 275 kilometres (234½ miles). The headquarters, which marched with the detachment Mueller, was in communication by wireless telegraphy with the detachments von der Heyde and von Estorff, distant respectively 40 and 75 kilometres (25 and 47 miles); it was in communication by optical telegraphy with Colonel Deimling, 35 kilometres (22 miles); with Captain von Fiedler, 70 kilometres (43½ miles); and finally, with Lieutenant Volkmann, 125 kilometres (75 miles) off. A service of *estafettes* also kept up communication between the different columns.

On the 7th August, reliable reports having confirmed that the Hereros were assembled in considerable numbers — some 5,000 or 6,000 of whom were armed with modern rifles—in the triangle comprised between Otjosongombe, Hamakari and Omuweroume, General von Trotha sent to his detachments orders to move forward on the 10th August, so as to be ready to attack simultaneously at 6 a.m. on the 11th. The different points assigned were as follows:—

To the columns Mueller and von der Heyde, Hamakari, Lieut.-Colonel Mueller attacking from the south and Major von der Heyde from the north-east; the column Deimling, Omuweroume; the column von Estorff, Waterberg.

These two last detachments were, after gaining possession of Waterberg and Omuweroume, to co-operate as far as possible in the fighting about Hamakari, taking the Hereros on the flank or in reverse.

¹ Nos. 2, 3, 4, and 6 of the 2nd Regiment, the 7th Battery, and half of the 1st Battery, a total of 20 officers, 478 rifles, and 6 guns.

² The 1st Company of the 2nd Regiment, the 8th Company of the 1st, and the other half of the 1st Battery, a total of 4 officers, 180 rifles, and 2 guns.



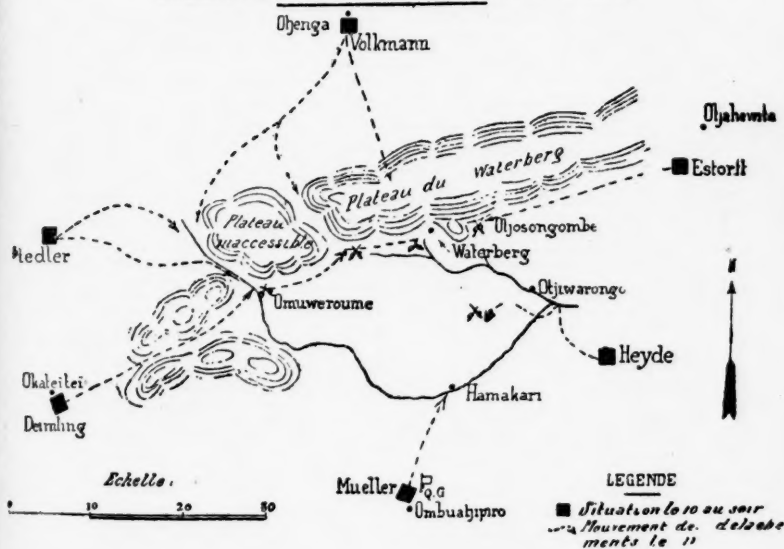


The detachments von Fiedler and Volkmann, were assigned the duty of barring the line of retreat to the northward to the Hereros. (See Plan.)

The Hereros offered resistance to the four columns. Major von Estorff came in contact with the enemy at Otjosongombe, and succeeded in pushing them back towards Waterberg; but he was not able to reach the water springs, and had to remain for the night at Otjosongombe. Major von der Heyde, attacked by superior forces 15 kilometres (9½ miles) to the north-east of Hamakiri, was only able to maintain his position with difficulty, and fell back at night on Otjiwarongo.

The Hereros made only a weak resistance at Omuweroume, and retired in an easterly direction, driving before them a numerous

COMBATS DU WATERBERG (11.8.1904)



herd of cattle. Colonel Deimling followed in pursuit, but it was only at nightfall that he was able to reach Waterberg with the main body of his detachment, and he halted there.

The column Mueller¹ was thus left to its own resources; but after a very hard struggle, which lasted all day, it succeeded in defeating the Hereros, but was unable to pass Hamakiri.

The detachments von Fiedler and Volkmann had on their side, without striking a blow, taken possession of the principal passes to the north of the Waterberg.

¹ Commanded by Major von Mühlenfels, in place of Lieut.-Colonel Mueller, who had been injured by a fall from his horse.

On the following morning, the German columns found themselves facing each other; but the enemy had disappeared. Taking advantage of the gap of 15 kilometres ($9\frac{1}{2}$ miles) left open between the detachments Mueller and von der Heyde, the Hereros escaped towards the south-east, carrying away with them the greater part of their wives, children, and cattle. The success was not, therefore, as complete as General von Trotha had hoped to attain. With the resources at his disposal, and working in a country covered with brushwood, it was difficult for him to have done better. With the 13 companies of the von Estorff, Mueller, von der Heyde, and Deimling Detachments, it was materially impossible for him to guard all the accessible paths abutting on the front of 40 kilometres (25 miles) occupied by the Hereros, and he had to confine himself to guarding the principal ones. The perfect knowledge which the insurgents possessed of the smallest paths, the facility that the woody nature of the country gave them to pass through unseen, even when within a short distance of the German columns, rendered illusory, *a priori*, the hope of capturing them in a body, by a single and fortunate cast of the net; the most that could have been hoped for was to seize the cattle which constituted their principal resource. The check received by the von der Heyde column did not even allow of this material result being obtained. The moral results were, nevertheless, considerable. As ulterior events showed, the check sustained at the Waterberg broke the strength of the resistance and moral energy of the Hereros; their want of success marked for them the commencement of an ill-omened period, in the course of which, everywhere hunted, holding no part of the country, thrown back into the dreadful deserts of the Sandfeld, they had no other alternative than surrendering, passing into English territory, or resigning themselves to perish, victims of hunger and thirst.

The fighting on the 11th August cost the Germans 5 officers, 6 non-commissioned officers, and 18 men killed; 7 officers, 10 non-commissioned officers, and 44 men wounded.

(To be continued.)

THE NEW GERMAN RIFLE BULLET.

Communicated by the War Office.

TWO of the most important properties which a military rifle can possess are great ranging power and a flat trajectory.

These properties depend mainly on two factors, high muzzle velocity and high sectional density, *i.e.*, a high ratio between weight and cross section of bullet. A third factor is the shape of the bullet, more particularly the shape of the head, by which the resistance of the air is considerably modified.

Considerations of recoil, weight of rifle, etc., make a heavy bullet incompatible with high muzzle velocity, and in order to keep the sectional density as high as possible, it has been found necessary, as the evolution of the rifle has progressed, to reduce the diameter of the bullet as well as to reduce its weight. In modern military rifles the diameter of the bullet varies between 0.32 and 0.26 inch, the corresponding weight of bullet being from 244 to 163 grains.

The German military authorities have been experimenting for some time past with a view to increase the muzzle velocity of their rifle to approximately 3,000 feet per second, in order to insure the flattest possible trajectory at decisive ranges, a consideration which they regard as of primary importance.

There were obvious objections to doing this by reducing the calibre of their rifle from 0.311 to 0.256 (or some smaller calibre) which would be the first method to suggest itself. Apart from the great cost involved in such a change, there are certain objections to a very small bore, *per se*, viz., diminished wounding power and increased difficulty of cleaning and keeping in order the interior of the barrel.

The alternative solution was to improve the ballistics of the existing rifle by a suitable modification of its ammunition, and it appears, from a recent article in the *Kriegstechnische Zeitschrift* (1905, *Heft* 9), that this has been effected partly by the adoption of a more powerful charge (whether a new powder is involved is not quite clear) but mainly by the adoption of a new bullet, known, on account of its pointed shape, as the *Spitze-geschoss* or "S" bullet.

This bullet (a sketch of the reported shape of which, together with further details, is appended) weighs only 154.3 grains as against the 227 grains of its predecessor, or as against the 215 grains of our Lee-Enfield bullet.

This reduction of 73 grains weight, coupled with the higher pressure given by the new charge, has apparently raised the muzzle velocity of the German Mauser from about 2090 f.s. to about 2900 f.s.

An additional and by no means unimportant advantage secured by the reduction in weight of the bullet is that about 15 per cent. more ammunition can be carried than heretofore.

It will be seen that in designing their new bullet the Germans have deliberately departed from the principle, hitherto considered essential, of a high sectional density.

Assuming, however, the correctness of the published data, it is evident that this low sectional density has been compensated for by the altered shape of the new German bullet, which gives rise to a very much lower air resistance than has hitherto been considered possible at normal atmospheric temperature and pressure.

The importance of the alteration in form may be gauged by the fact that had the normal shape been retained, the remaining velocity of the bullet at about 1,000 yards would have been no greater than that of our bullet, which starts at 800 f.s. lower velocity, while beyond 1,000 yards the heavier bullet would have travelled faster.

As it is, the "S" bullet maintains its superiority in velocity at practically all ranges. Whether it compares favourably with the heavier bullet in accuracy is, however, doubtful.

The greatest advantage given by the "S" bullet in the matter of flatness of trajectory is to be found between 500 and 800 yards. At 700 yards range a man 5 feet 9 inches in height would be hit anywhere along the range if the muzzle of the rifle were 12 inches from the ground, the sights set at 700 yards, and the ground line aimed at. The same effect would only be produced with our present service rifle at about 550 yards.

Without experimental data it is difficult to estimate exactly the energy of recoil of a 9-lb. rifle with a muzzle velocity of 2900 f.s. and a 154-grain bullet, but it would appear to be well below the limit of 15 ft.-lb., which is the maximum desirable in a military rifle.

Two further questions affecting the military value of the new bullet arise: its wounding power, and its penetration.

Taking the striking energy of the bullet as the measure of its wounding power, it would seem that the new bullet is more effective than the Lee-Enfield up to between 900 and 1,000 yards; beyond that range it is slightly inferior, but the difference is not marked.

Apart from its superior striking energy, however, the so-called explosive effect characteristic of modern high-velocity bullets at close ranges would probably be occasioned by the "S" bullet at very much greater ranges than is at present the case; possibly up to 600 or 700 yards, as against 200 or 300 with the present bullet. Experiments, however, would be necessary to test this point.

As regards penetration, the advantage must lie with the new bullet at all except extreme ranges.

Diagrams of the new and old German bullets, and of our 0.303 bullet, together with comparative ballistic tables and diagrams of trajectories, are appended.

RANGE TABLES.*

Range.	Lee Enfield. "C" = 0.411. "S" Bullet. "C" = 0.40.											
	Angle of projection.		Time of flight.		Remaining velocity.		Striking energy.		Max. height attained.		Angle of descent.	
	L.E.	"S."	L.E.	"S."	L.E.	"S."	L.E.	"S."	L.E.	"S."	L.E.	"S."
yards.	dgs.min.	dgs.mns.	secs.	secs.	ft.-secs.	ft.-secs.	ft.-lbs.	ft.-lbs.	feet.	feet.	dgs.min.	dgs.min.
0 ...	0 0	0 0	0	0	2,060	2,909	2,036	2,916	0	0	0 0	0 0
200 ...	0 9	0 4½	0.32	0.23	1,673	2,355	1,343	1,910	0.4	0.2	0 11	0 5
400 ...	0 21	0 10½	0.72	0.52	1,361	1,900	889	1,244	2.1	1.1	0 28	0 14½
500 ...	0 29	0 14½	0.95	0.68	1,229	1,712	724	1,009	3.6	1.9	0 40	0 21
600 ...	0 37½	0 18½	1.21	0.87	1,119	1,538	600	814	5.8	3.0	0 55	0 28½
800 ...	0 59	0 29½	1.78	1.30	981	1,239	461	529	13.3	6.8	1 36	0 53
1,000 ...	1 25	0 45½	2.43	1.83	886	1,039	377	371	24.9	14.0	2 25	1 30
1,200 ...	1 58	1 5½	3.14	2.44	807	930	313	298	42.2	25.2	3 26	2 19
1,500 ...	2 56½	1 46	4.33	3.50	708	803	240	222	83.5	53.5	—	—
2,000 ...	5 8	3 21½	6.70	5.60	569	642	155	142	198.0	141.0	—	—

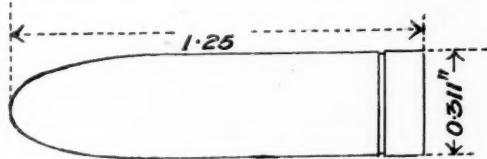
* The "S" table has been calculated upon the basis of the article in the *Kriegstechnische Zeitschrift*.

Similar tables, based upon slightly different data, have appeared in the *Field* of the 16th December last, and in the January number of *Arms and Explosives*.

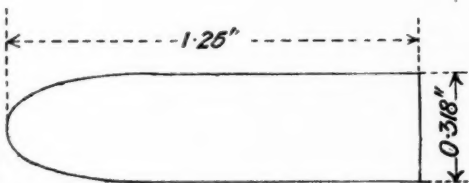
BRITISH AND GERMAN RIFLE BULLETS.

Scale $\frac{1}{4}$.

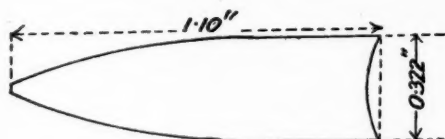
GREAT BRITAIN.
Weight, 215 grains.



GERMANY, 1888-1905
Weight, 227 grains



GERMANY, 1905.*
(Reported shape of "S" bullet.)
Weight, 154.3 grains.

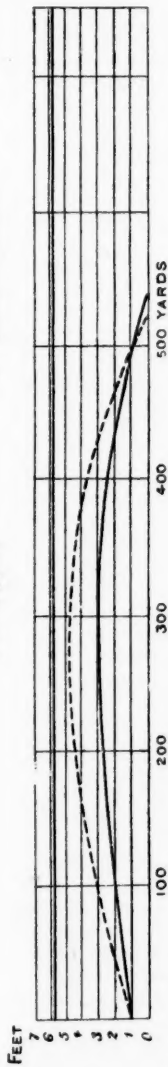


All three bullets have lead cores, the British bullet having a cupro-nickel jacket, the jackets of the two German bullets being of nickel-plated steel.

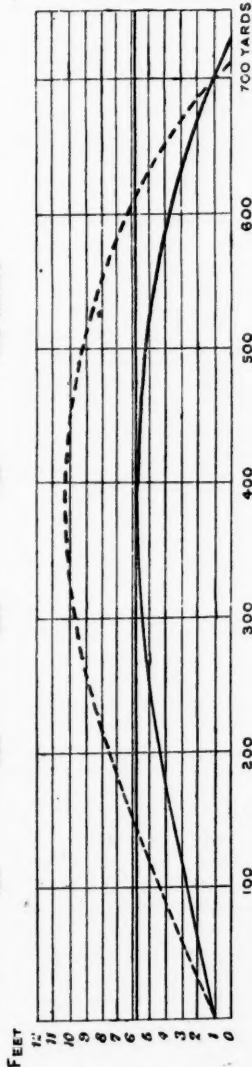
**Kriegstechnische Zeitschrift, Heft 10, p. 607*

TRAJECTORIES OF LEE-ENFIELD AND "S" BULLETS AT 500, 700, AND 800 YARDS, MUZZLES 1 FOOT FROM GROUND.

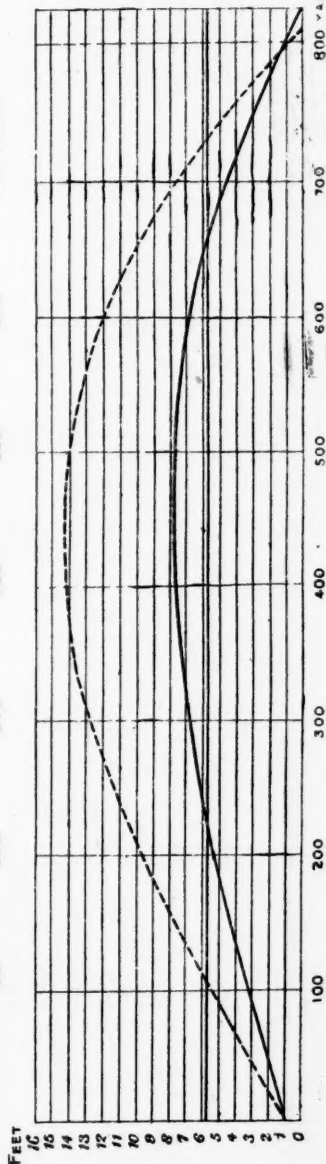
L.E. (upper) - - - - - "S" (lower) - - - - -



A standing man 5' 9" in height would be hit by either bullet at 500 yards.



The same man would be hit by the "S" bullet over the entire range of 700 yards, while with the present Lee-Enfield bullet he would only be hit over about 250 yards.



The same man would be hit over about 350 yards of an 800 yards range by the "S" bullet as against about 180 with the Lee-Enfield.

PRIMARY CONDITIONS FOR THE SUCCESS OF CAVALRY IN THE NEXT EUROPEAN WAR.

*Lecture given before the Berlin Military Society by Lieut.-General
von PELET-NARBONNE.*

Translated by permission.

Continued from January JOURNAL, p. 102.

IN order to assist at arriving at a correct judgment of the efficiency of the Prussian cavalry in the war of 1866, a quotation is here made from the words of General von Moltke in a report to King William I. on the 25th July, 1868.¹

The General says: "Where, in the war of 1866, the Prussian cavalry were successful in action, it always charged down upon the enemy. Some individual squadrons and regiments again and again showed themselves superior to the enemy, and some splendid march operations have been performed. Still, the value of this arm remained comparatively speaking, small, while a large number of units never came in contact with the enemy at all." In another place, he says, "Practically the cavalry *never* supported the infantry." The General quotes only ten instances "where regiments, as regiments, and one where a brigade have attacked. On the other hand, the cavalry was often not at hand when required, and had to be sent for. At Königgrätz, where the cavalry of the 1st Army was opportunely in the right place at the right time, but was prevented from moving forward until the infantry had crossed the Sadowa, it neglected to prepare and arrange crossing places. Only two fords were practicable, and the leading detachments came into action before those in rear were across. When the general pursuit should have begun, the action of the cavalry ceased altogether. Some brigades remained quite inactive. The reserve cavalry division of the 2nd Army was kept so far in rear that it only came up at the end of the battle. The cause of the indifferent performance of the cavalry lies not in the material, but in the leading, the formation, and the distribution. The cavalry also often shirked coming under shell fire." I shall come back later to this point.

Moltke then remarks: "Our cavalry failed, perhaps, not so much in actual capacity as in self-confidence. But all its initiative had been destroyed at manœuvres, where criticism and blame had become almost synonymous, and it therefore shirked independent bold action, and as much as possible kept out of sight far in the rear." Further on, Moltke complains "that the reserve cavalry of the 1st and 2nd Armies, which, in spite of the supply difficulties, was

¹ Moltke's "Taktisch-strategische Aufsätze aus den Jahren 1857-1871." Berlin, 1900.

carefully kept in hand until the battle of 3rd July, was then never thrown in front of the advancing columns just when it might have performed important reconnaissance duties." He concludes with the words: "The reserve cavalry of the 1st and 2nd Armies has been employed very little,¹ or not at all, in the duty of guiding the Army. For long distance scouting this cavalry has never been used at all."

If one compares the efficiency as sketched by Moltke—of the Prussian cavalry of 1866—(that of the enemy in self-sacrifice, as shown on the 3rd July, was on much the same plane), with the performances of the arm in the American Civil War above-mentioned (see JOURNAL for January last, pages 100-102), one *must impartially admit, after consideration of the different conditions, that there was the real article*. How helpless and inept were these European horsemen compared with those led by Stuart.

Most extraordinary of all, to our modern ideas of the employment of cavalry, seems the meagre use made of the mounted men for reconnaissance. As though Murat's cavalry divisions of the French Army had never been sent far to the front, with us the cavalry force—known by the ill-omened name of "Reserve cavalry"—was kept in rear, while the divisional cavalry, composed of advanced guard, main body, and reserve, reconnoitred anything but far afield. Thus approved methods were altogether forgotten, a heavy indictment against the manner in which military history has been studied during the years which have elapsed since the Napoleonic wars.²

We shall see that the defects recognised by Moltke in 1866 were remedied in 1870-71, so far as concerns the work of reconnaissance, and so far also as reform was possible in so short a time. Other shortcomings, which had not revealed themselves in the brief campaign and which were unnoticed by Moltke—such as the unsatisfactory fire-arm, and the want of practice in its use—were not remedied. A further evil, which may not have come before the General, was the poor condition of the numerous registered horses in the squadrons—this was, however, noticed, and the cavalry reorganisation, which had already been put in hand, was continued after the war. In regiments where it had not already existed, a fifth squadron was raised, and this was not mobilised as in 1864 and 1866, but was organised as a *depôt* or reserve squadron, whereby the intrinsic value of the cavalry was appreciably increased.

In connection with this reorganisation, I would emphasise the immense importance for our cavalry of this particular work, and that *any tampering with the principle of having as few registered horses as possible in the field squadrons, must seriously lower the efficiency of the arm*. May the cavalry be spared so mischievous and retrograde a step! The experiences of the War of Liberation have already shown us what we may expect from the admission of raw young horses in the ranks, for not only do these soon succumb under hard work, but when drafted into the field service squadrons in large numbers they lower the whole level, since any demands made on the troops must be carried out according to the powers of the horses with least endurance. I may here, perhaps, recall a personal experience. In the ranks of

¹ After the battle on 3rd July.

² "Geschichte des Krieges von 1866 in Deutschland," von Lettow-Vorbeck. 1 Bd. Gastein-Langensalze. Berlin, 1896.

the squadron which I commanded in 1870, there were twelve remounts—a fair enough number since one can always employ some of these as batmen's horses to accompany the wagons. Of those in the ranks four succumbed to the hard work of a reconnaissance, carried out by the squadron from Weissenburg, across the Sauer at Gunstett,¹ and only two of them ever again saw their garrison at all.

I now come back to Moltke's remark that the cavalry shirked exposure to shell fire. As an example, in the report of the battle of Königgrätz, reference is made to a cavalry brigade of the Elbe Army, which did nothing, but which, according to its own account, was subjected to a heavy artillery fire in which "the shells were bursting close in front of the brigade"—result, one wounded hussar! Whence this avoidance of casualties so often noticed with the cavalry? The men on horses are the same brave fellows as their comrades on foot, and when on patrol, they showed themselves cool and daring even to foolhardiness. The cause must be sought in the training under which the leaders were formed. One heard everlastingly repeated the axiom that cavalry must not run the risk of incurring casualties from fire prior to the charge, it must, therefore, be kept in the rear; this great respect for infantry fire, which, in itself, was quite justifiable, had developed a timidity for coming to grips at all—we shall find the same when we come to consider the Russo-Turkish War—and all the talk about "the costly arm—more difficult to replace than the others"—may also have contributed to this ultra-caution. We should remember the construction which General Carl v. Schmidt gave to this dogma, and which he thus expressed: "This arm is far too costly to have any check placed on its employment." Principles, correct in themselves, have also done harm through an exaggerated stress being placed on them, particularly at manœuvres—see Moltke's Report—and one should be thankful that our cavalry is now taught to attack and come to close quarters with the other arms. Another, and perhaps the strongest, reason of all, for the poor results obtained by the cavalry on the battlefield, lies in the characteristics of many leaders. An attacking cavalry is like a shot which has been fired, the effect of which cannot be foreseen, and which, under certain circumstances, might recoil on the firers. Many a cavalry officer, personally brave enough, has shrunk from making up his mind to a course of action, the result of which cannot be determined in advance, and which may demand great, and perhaps fruitless, sacrifices from his men. With the other arms it is possible to break off an action—not so with the cavalry charge, fate must run its course. "*With cavalry, everything depends exclusively upon the initiative of the commander, hence the immense importance of the personal element. Without his direct personal influence, nothing can be done.*" On the other hand, it may, for instance, be quite conceivable that a division of infantry in a chance encounter wins the day entirely through the natural course of events, and the energetic action of the subordinate leaders, without the divisional general having had anything whatever to do with obtaining this result. The leaders of bodies of cavalry attached to other arms, whose commander is slow to make up his mind, might, in such a case, be less inclined than usual to order an attack to be carried out, which they know to be necessary. The

¹ General Staff History, p. 201.

cavalry commander, free from all responsibility, would, no doubt, accept such an order gladly and carry it out with skill and energy. The celebrated charge by Bredow at Vionville would probably have never been made had a direct order not been received. Sometimes theory and sometimes practice is the chief factor in achieving great results.

Cavalry must be educated up to a readiness to act, absolutely regardless of consequences, and to a determination to conquer. We must recognise that there is nothing out of the common in the blood of a mounted man; this arm must risk casualties, as the infantry has often done before, without losing its battle value; while exaggerated ideas must be avoided, as, for instance, where the charge just mentioned has been dubbed "the death ride," as though such an action had never previously been heard of. Such an attack has been made before with the same bravery and equal losses, as also have many deeds of the other arms, without much fuss having been made about them.¹ The faults, from which the German cavalry suffered during the war of 1870-71, were due—in so far as they have not already been dealt with—to the *Personality* of the superior commanders—a question, the importance of which had been frequently emphasised, but not altogether happily solved—more especially in the fact that they avoided every opportunity of manœuvring the division entrusted to them, so that in consequence of this fault, many of them would certainly and naturally have been found deficient in self-confidence if they had been suddenly called upon to command 24 squadrons combined. This want of confidence, felt and apparent, to perform the duty laid upon them, could be seen from the fact that the divisions were hardly ever manœuvred as a whole; they worked with three separate brigades, each of which had its own orders, and not infrequently the divisional general rode apart with his staff, taking no part in what was going on. So, for instance, the 5th Cavalry Division, in its operations the day after Metz, and the 4th in the advance from Chartres to Coulmiers on the 9th November, the latter in the former battle.² Since one cannot imagine that the senior officers at the head of these divisions did not know the value of concerted action, the explanation of this phenomenon may be found above, while also the reluctance to launch the whole division to the attack may have had something to say to it.

Another fault was, further, that when the war broke out, not only were the divisions improvised, but, to some extent, also the brigades. Commanders did not know their staffs, and had no knowledge of the capabilities of the subordinate leaders; this had the worst possible results, for, in the case of most important duties, those detailed for them, according to seniority, were often the least capable of carrying them out. That the unavoidable friction caused by such improvisations has far worse consequences for cavalry than for the

¹ "Das Leben des Soldaten im Gefecht, wo es sein muss, ohne Bedenken zu opfern, dies ist das grosse Kriegsgesetz, dem sich der Soldat wie der Anführer mit gleicher Bereitwilligkeit unterwerfen muss." Boyen, Denkwürdigkeiten II.

² On this occasion the divisional commander was present with one brigade.

other arms, and that misunderstandings arise which are difficult to smooth, will be apparent to all; clear, full tone can only be got from a well-trained orchestra.

Another bad thing was the inadequate armament. Whole divisions did not possess a single regiment armed with carbines, while the weapon itself was of but small value, and the troops had not been properly trained to its use. The training with the *arme blanche* was good enough, but still many faults in equipment passed at that time unnoticed. Training in reconnaissance was then not nearly so thorough as it is now, although good enough compared with the utter inefficiency of the enemy's cavalry in the first part of the war, but we often failed from unsatisfactory armament under the conditions which arose later in the "People's War."

In spite of all faults, many smart performances by the cavalry in this war show us that a good beginning had been made with these regiments, where they were well handled, and *Vionville will always remain as a proud page of glory in the history of the Prussian cavalry*. But how often again has this same cavalry sat still and watched the struggles of the sister-arms, although they may have longed to take part, and the laurels, so to speak, lay on the road in front of them? Beaune la Rolande is a case in point; while Artenay and Coulmiers might each have been another Rosbach for the German cavalry. The importance of the personal element is ever apparent. How differently would things have turned out had a General Carl von Schmidt or a Colonel von Alvensleben been in command. Is it mere chance that the regiments trained and led by these men fought with such special distinction; that the 16th Hussars were engaged, mounted and on foot, more frequently than any other cavalry regiment of the whole Army; and that in the 15th Uhlans all the four squadron commanders found occasions to win for themselves the Iron Cross of the 1st Class? Many regiments had the same opportunities to come to the front, but they did not take advantage of them; the cause of this has been discussed.

As before, after the Napoleonic wars, so now no doubt was felt that the achievements of the cavalry were not up to what had been anticipated, and a cavalry committee, which was formed on the 13th March, 1872, in Berlin, was ordered to deliberate on "the changes and modifications necessitated in the drill books of 1855 by the latest experiences, and on the orders for the instruction of the troops in field duties," further, "what changes were required in armament, clothing, and equipment."

The proceedings of this committee did not remain buried in their reports, as was the case with the proposals of Blücher and his generals, but they have formed the basis of a reorganisation of the German cavalry, which has placed this arm in a position to await the future on the field of honour with joy and confidence.

The remodelling and improvement of the cavalry has not, however, come to an end with the progress already made; circumstances demand further improvement in every direction—to stand fast, content with what has been done where there can be no finality, would be to go back.

(To be continued.)

THE VON LÖBELL ANNUAL REPORTS ON THE CHANGES AND PROGRESS IN MILITARY MATTERS IN 1904.

Précis from the German by LIEUT.-COLONEL E. GUNTER, *p.s.c.,*
(late) East Lancashire Regiment.

Continued from the December JOURNAL, p. 1414.

PART III.

CONTEMPORARY MILITARY HISTORY.

The Historical Summary of the past year's events is a very comprehensive one. It comprises:—

- I. The fighting in Somaliland under General Egerton.
- II. *a.* The insurrection of the Hereros in German S.W. Africa from its commencement to the end of 1904.
b. The fighting in the Cameroons.
c. The revolt in New Guinea.
- III. The Russo-Japan War from its opening to the Battle of Liao-yang and the fall of Port Arthur.

Our officers are well acquainted with the first.

It would be of great interest to epitomise the operations against the Hereros, etc., but space considerations forbid it.

The account of the Russo-Japan War up to the end of 1904 is so long, covering 34 closely printed Post 4to pages of German type, that it is impossible to do more than give a few extracts from this valuable summary, which is divided under the following heads†:—

1. Causes of the war.
2. Strength of the opposing forces; their mobilisation.
3. The fighting for the command of the sea down to Admiral Makaroff's death on the 13th April.
4. Land operations up to the passage of the Yalu (3rd April).
5. The Japanese landing on the Liao-tung peninsula and the investment of Port Arthur (27th May).
6. The battle of Wafankou (15th June).

†The spelling of names of places, etc., in the Report is apparently taken from Russian maps. I have endeavoured to put them into the form mostly used by English correspondents, but many places have different forms of names.—E.G.

7. The advance of the Japanese to Liao-yang, and the battle of Liao-yang (to 5th September).
8. The attack on Port Arthur and the events at sea (till October).
9. The Russian offensive for the relief of Port Arthur (5th October to 21st October).
10. Operations down to the fall of Port Arthur (2nd January, 1905).

The political situation at the outset is very succinctly stated, and as the compiler is, if anything, slightly biased in favour of the Russians, and has apparently derived much information from Russian sources, the account is especially valuable to British officers, who for the most part have probably studied the accounts of British war correspondents with the Japanese forces.

Those who wish to get a good general idea of the campaign from the point of view of the trained intelligence of the German officer cannot do better than study closely the account in "*von Löbells Jahresberichte*," comparing it with those in English from other sources. Several clear sketch maps are given with the report, adding much to its interest. The Report gives the Russians unstinted praise for the defence of Port Arthur.

THE OPPOSING FORCES.

Russia.†—On the outbreak of the War (February, 1904) the following troops were available in Eastern Asia for the Field Army:—

- 76 East Siberian Rifle Battalions, almost at war strength;
 - 16 European Infantry Battalions, on a peace footing;
 - 35 Squadrons and Sotnias, almost at war strength;
 - 25 Field and Horse Artillery Batteries, almost at war strength.
- In round numbers about 90,000 sabres and rifles, 196 guns, 8 machine guns.*

They were mobilised on the 10th February. The first reinforcements of large bodies (corps, etc.) were despatched in the beginning of May. The line of communication was a single-line railway, the Trans-Siberian Railway, through Sysran, Tscheliabinsk, Irkutsk, and Kharbin.

The distance to Port Arthur is 7,243 versts (about 4,800 miles)

" " Vladivostok is 7,193 " (" 4,182 ")

The Lake Baikal Circuit Railway was not ready at the beginning of the war, and much rolling stock for traffic east of Lake Baikal was deficient.

On the whole the troops were transported at the rate of about 6 miles an hour. It took about 6 weeks getting them from Warsaw to Mukden. As soon as an Army Corps was despatched it took about 2 weeks getting its provisions and the necessary reinforcements to supply the daily wastage sent after it.

†The JOURNAL for October, 1904, gave on p. 1137 the approximate strength in Kwantung, etc. Also on p. 1136 the organisation of the Siberian Corps following.—E.G.

*See Table on p. 228.

On the whole, the service rendered by this railway was remarkable. Only in the early spring and in December was the traffic interrupted; in the first case for 2 or 3 weeks; in the second for 2 or 3 days.

Japan.—The armed strength of Japan† at the outbreak of the war, including all its 13 active Divisions, 2 Cavalry and 2 Artillery Brigades, was 156 Battalions, 55 Squadrons, 117 Batteries. Total, 165,000 rifles and sabres and 702 guns. Each Division had also a Reserve Brigade of 6 Battalions, 1 Squadron, and 1 Battery on foot. These were, in the case of at least half the active Divisions, doubled on the outbreak of the war, so that each had a Reserve Division to reinforce it. It was not till after the battle of Liao-yang, however, that these Reserve troops came up into the first line. Besides these, other 2nd line troops were used on the line of communications, regarding which no details have transpired.

The Japanese Landwehr and Landsturm organisation is stronger than was supposed.††

It was not necessary to mobilise the whole Army at once, as transport was not available.

The Japanese Merchant Service, after supplying their Navy with the necessary hospital-ships, coaling, ammunition, machinery, and workshop-vessels, etc., was able to transport at one time across to Korea 4 active Divisions with their trains.

It took 3 days to embark a Division and 5 days to disembark one. Inclusive of the time of coming and going, preparation, etc., it would be about 15 days before the whole 4 Divisions were landed. On this calculation it would have been about the middle of April before all 13 were across.

As a matter of fact, the whole Army with its Reserves were not landed till near the end of the year; but this was because the Japanese War Ministry did not consider it necessary, not because they were unable to do it sooner.

The mobilisation went on quite smoothly. The want of horses was met by purchases in foreign countries.

In September the active Reserves having been exhausted, the service in the Landwehr and liable to service abroad was extended, and that in the Landsturm also prolonged.

Filling up the places of the officers was a more difficult matter. Some promotions from the non-commissioned ranks have taken place, and the cadets of the Military Colleges have been commissioned much earlier than is the rule.

The following table shows roughly the approximate total strengths of both Armies with subsequent reinforcements in 1904:—

†For details see the JOURNAL for October, 1904, p. 1130.

††It was stated in the newspapers that a 5th Army of 8 Divisions, 140,000 men, was being formed in March from the Reserves of 1887-91, to move up on the right of the other armies in Manchuria; and a Reserve Force, formed from those discharged to the Reserve, 1884 to 1886, was retrained for the Defence of Japan. The vast numbers deployed by Japan at Mukden and after bear out the text.—E.G.

RUSSIA.*						JAPAN.							
Period.	Increase owing to Reinforcement.**	Bn.	Sqdn.	Batt.	Total Sabres & Rifles.	Guns.	Fresh Units.	Active Divns.	Res. Brig.	Cav. Brig.	Art. Brig.	Total Fighting Strength.	Guns.
1904.							Regular Divns.						
Feb. 6.	E. Sibn. Troops and 2 Half European Divs.	92	35	25	97,250	196	9, 2, 12,	3	2	—	—	54,000	120
Apr. 30.	E. Asia Res. Formations.	140	75	49	151,250	382							
May 15.		140	75	49	151,250	382	1,3,4,5,1	7	2	1	1	111,200	372
June 15.	Sibn. Cossack Divn. 1Vth Siberian Army Corps. Orenburg Ural Cossacks.	173	117	61	190,550	474	6, 10, 11.	10	2	1	1	153,200	480
July 31.	Xth, XVIIth Army Corps, Caus Cos.	221	183	85	248,450	662	9 R.	11	3	1	1	173,200	522
Aug. 31.	Vth Sibn Army Corps	253	183	107	280,450	830	2nd C.B.,	11	5	2	2	216,400	672
Oct. 15.	Ist Army Corps, VIth Sibn. Army Corps.	317	183	131	344,450	1,022	2nd A.B.						
Dec. 31.	4 Don Div., 61 Inf. Divns., VIIIth Army Corps. 1st and 2nd Rifle Brigades.	381	207	165	412,050	1,282	7, 8	13	10	2	2	244,400	744

*At the beginning of the war, Russia formed a new East Siberian Army from the East Asian troops, reinforced from the European Army.

**The Russian strength, as above, is the total paper strength, from which about 30 per cent. should be deducted for the effective strength.

The Japanese total strength is given as near as can be reckoned. By continuous steady reinforcement, they, however, keep up their effectiveness to it.

The Operations.

On the 10th February, 1904, Admiral Alexieff was appointed Commander-in-Chief both of the sea and land forces. He gave over the command of the land forces in Southern Manchuria to General Linievitch,† Commander-in-Chief of the troops of the Amur District.†† On the declaration of war he at once sent his Cossacks across the Yalu and Tumen rivers into Korea. When General Kuropatkin arrived in Liao-yang as Commander-in-Chief, General Linievitch resumed his command (27th March, 1904). General Kuropatkin ordered Liao-yang to be entrenched, and that no offensive movements were to be attempted until he had obtained all the necessary reinforcements.

The Japanese general plan of operations has never transpired. From their course we may take it to have then been roughly:—

1. The occupation of Korea.
2. The cutting off of Port Arthur by sea and land; its capture.
3. The destruction of the Russian Fleet to secure command of the sea.

†Now, Commanding in Chief the Russian Forces in Northern Manchuria.

††See the JOURNAL for 1901, p. 1191, and others.—E.G.

4. A concentric advance from the Yalu, Taku-shan, and Port Adams against the Russian Field Army, assumed to be at Liao-yang.

The landing of General Kuroki's Ist Army began on the 13th March, 1904, under very unfavourable weather conditions.

The leading troops reached the River Yalu early in April, but it was not till the 20th that the whole Army was concentrated about Witschu.

General Kuropatkin had then only 65,000 men with him. He detached General Sassulitch, the commander of the IInd Siberian Corps,† with orders to delay the passage but not become too seriously engaged.

On the 30th April the Japanese, feinting against the Russian right, crossed opposite their left, and held their centre. On the 1st May the 12th and 2nd Divisions forced the Russians to retreat to Feng-hwang-cheng, and through it to the passes covering Liao-yang, followed by the 1st Japanese Army, which was based on the lower Yalu.

5. The beginning of the investment of Port Arthur.

The IInd Japanese Army (1st, 3rd, 4th Divisions, 1 Cavalry Brigade, 1 Artillery Brigade), under General Baron Oku, had completed its mobilisation by the middle of March; but it was not till after the middle of April that it embarked for Korea. It was kept about Chinampo until the 1st Army had forced the passage of the Yalu.

On the 12th May the telegraphic and railway communication between Port Arthur and the rest of the Russians in Manchuria was interrupted.

The Japanese Fleet covering the landing of the troops suffered heavy losses; 1 vessel of the line and 1 aviso were blown up. A small cruiser was sunk in a collision.

On the 21st May the IInd Army reached the country north of Kinchau.

On the 26th it attacked the Russian entrenched positions on the Nantshan range. After severe fighting the 4th Division took the position, assisted by the fire of the Japanese gun-boats.

On the 27th May the Japanese occupied Talien-wan, and on the 29th May Dalny. They were thus enabled to push forward to within about 36 kilos. (25 miles) of Port Arthur.

6. The Battle of Wafangu (Wafangko).

While the IInd Army was advancing successfully against Kinchau, the 10th Division had landed at Takushan. It was intended to act as a connecting link between the 1st and IInd Armies.

The 1st and 11th Divisions were now formed into a IIIrd Army, and placed under command of General Baron Nogi, to carry out the investment and capture of Port Arthur.

The IInd Army (3rd, 4th, 5th, 6th Divisions, 1st Cavalry Brigade, 1st Artillery Brigade) was to advance northwards.

The Russian Commander-in-Chief, Kuropatkin, now determined on assuming the offensive with a force consisting of 42 Battalions, 24 Squadrons, 12 Batteries, under General Baron Stackelberg, Commander

†The 2nd Siberian Corps had 2 or 3 Brigades each of 4 Regts., each of 3 Battalions at the outset, but (see Table also, p. 228) Divisions were, however, soon formed, and the East Siberian Corps re-organised.—E.G.

of the 1st Siberian Army Corps. Behind this force he had the bulk of the IVth Siberian Army Corps at Haicheng. The Eastern Detached Force,† strengthened by half a Division of the IVth Siberian Army Corps, was to secure the northern communications of the Army, and Lieut.-General Count Keller was now appointed its Commander.

On the 30th May the 1st Japanese Cavalry Brigade was checked by a superior force of Russian Cavalry at Wafanku, and their Infantry advanced guard troops forced the Japanese back to Wafantien, while their main body coming up entrenched at Wafantou.

The Japanese 6th Division of the IIInd Army had been delayed at Port Adams, so General Oku, the Army Commander, decided to push on without it with his three other Divisions. On the 13th they reached Wafantien, 17 kilometres (11 miles) south of Wafantou.

On the 15th June he led the 3rd and 5th Divisions in frontal attack against the Russian Southern Detached Force, while his 4th Division threatened their right flank. The 5th Division, supported by 144 guns, held the Russians in front while the half of the 4th Japanese Division deployed about noon opposite the right flank. Fearing for his line of retreat, General v. Stackelberg ordered a general retirement about 3 p.m. His Commander-in-Chief had pushed forward all available troops towards Kinchau to help him, but his losses were severe, including many guns.

†This had fought under General Sassulitch on the Yalu.—E.G.

(To be continued.)

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Rear-Admiral—C. J. Barlow, D.S.O., to be Admiral-Superintendent of Devonport Dockyard. Captains—E. S. Fitzherbert to "Albemarle"; R. G. Fraser to "Ramillies"; W. G. Grogan to "Donegal"; H. R. Robinson to "Aboukir"; B. Currey to "Black Prince"; G. A. Ballard to "Euryalus"; C. Greatorex to "Eclipse"; R. H. Stewart, M.V.O., to "Argyll"; W. O. Story to "Cumberland"; C. H. Coke to "Cornwallis." Commanders—A. W. Heneage, M.V.O., to "Iphigenia"; R. Y. Tyrwhitt to "Attentive"; the Hon. A. D. Boyle, M.V.O., to "Isis."

Vice-Admiral Sir A. W. Moore, K.C.B., K.C.V.O., C.M.G., hoisted his flag on board the first-class armoured cruiser "King Alfred" at Portsmouth on the 23rd ult., and left on the 31st ult. for China.

The first-class battle-ship "Ocean" commissioned at Chatham on the 2nd ult. for the Channel Fleet.

The first-class armoured cruiser "Kent," which commissioned at Chatham on the 2nd ult., left Portsmouth on the 13th ult. for China, where she relieves the armoured cruiser "Hogue." The first-class armoured cruiser "Euryalus," flying the flag of Admiral Sir A. Fanshawe, K.C.B., late Commander-in-Chief in Australia, arrived at Spithead on the 7th ult.; Sir Arthur struck his flag the next day, and the ship will pay off and be placed in the Portsmouth Reserve Division. The new first-class armoured cruiser "Argyll" commissioned at Devonport on the 29th ult. for service with the First Cruiser Squadron, relieving the armoured cruiser "Monmouth," which paid off at Devonport on the same day. The second-class cruiser "Hermes," which commissioned at Portsmouth on the 9th ult. for service in the East Indies, where she relieves a sister-ship, the "Hyacinth," as flag-ship, left Portsmouth on the 25th ult. for her destination. The second-class cruiser "Indefatigable" commissioned at Portsmouth on the 9th ult. for service in the West Indies, where she relieves the third-class cruiser "Diamond"; she left on the 23rd ult. for her station. The second-class cruiser "Iphigenia," from China, paid off on the 10th ult. at Portsmouth.

Naval Expenditure and Mercantile Marine.—Return showing Aggregate Naval Expenditure on Seagoing Force; Aggregate Revenue; Aggregate Tonnage of Mercantile Marine; Annual Clearances of Shipping in the Foreign Trade; Annual Clearances of Shipping in the Coasting Trade; Annual Value of Imports by Sea, including Bullion and Specie; and Annual Value of Exports by Sea, including Bullion and Specie, of various Countries, exclusive of China and South American Republics, but including British Self-governing Colonies, for the Year 1904.

NOTE.—Except where otherwise stated, the figures refer to 1904. Where it has not been found possible to give the particulars for 1904, the figures for the latest year available have been shown.

Countries.	Aggregate Naval Expenditure on Senging Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine.	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade.	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
BRITISH EMPIRE	£	£	Tons.	Tons.	Tons.	£	£
United Kingdom	11,696,313 (a) (Year ended 31st Mar. 1905)	143,370,494 (Year ended 31st March, 1905)	10,554,520(b)	54,571,476	58,431,821	598,602,555	417,318,173
British India	541,590 (c) (d) (Year ended 31st Mar. 1904)	83,756,155 (e) (Year ended 31st March, 1904)	78,105 (e)	6,229,211 (o) (Year ended 31st March, 1904)	14,674,480 (p) (Year ended 31st March, 1904)	87,412,253 (c) (Year ended 31st March, 1904)	112,374,027 (e) (Year ended 31st March, 1904)
<i>Self-Governing Colonies (h)</i>							
Australian Commonwealth:							
New South Wales...	—	12,951,896 (Year ended 30th June, 1904)	118,960	1,426,154	No Returns	13,133,857	23,089,785
Victoria	—	8,407,617 (Year ended 30th June, 1904)	163,630	370,851	No Returns	12,739,986	16,172,394
South Australia (except Northern Territory)	—	2,907,041 (Year ended 30th June, 1904)	56,670	313,050	No Returns	3,254,398	4,649,657
Northern Territory	—	72,459 (Year ended 30th June, 1904)	534	37,472	No Returns	35,271	59,788
Western Australia	—	3,978,468 (Year ended 30th June, 1904)	21,414	738,760	No Returns	4,021,953	9,912,132
Tasmania	—	1,019,216 (i) (Year ended 30th June, 1905)	18,399	236,092	No Returns	805,606	631,050
Queensland	—	4,249,355 (Year ended 30th June, 1904)	23,973	229,933	3,658,938 (g)	3,029,771	2,973,810
Total: Australian Commonwealth	142,951 (q)	33,586,082 (f)	403,580	3,352,312 (l)	—	37,020,842 (p)	57,489,216 (q)
New Zealand	40,742 (r)	7,113,031 (Year ended 31st March, 1904)	109,859	1,144,794	9,733,969	13,291,694	14,748,348
African—							
Natal	35,000	4,160,145 (Year ended 30th June, 1904)	2,160	2,155,332 (j)	Nil	10,760,734 (l)	2,480,771 (k)
Cape of Good Hope	50,000	9,913,855 (Year ended 30th June, 1904)	4,813	5,312,325 (i)	5,803,764	21,645,825 (l)	28,308,417 (k)
American—							
Dominion of Canada	—	14,526,573 (Year ended 30th June, 1904)	682,838	7,682,849 (m) (Year ended 30th June 1904)	22,062,242 (m) (Year ended 30th June 1904)	29,141,000 (n) (Year ended 30th June 1904)	32,701,000 (n) (Year ended 30th June, 1904)
Newfoundland	4,308 (s) (Year ended 31st Mar. 1905)	516,691 (Year ended 30th June, 1904)	125,506	802,084 (Year ended 30th June 1904)	No Returns	1,942,225 (Year ended 30th June 1904)	2,134,057 (Year ended 30th June, 1904)

NOTE.—The above particulars with regard to Naval Expenditure have been furnished by the Admiralty. The remaining particulars have been extracted either from Board of Trade Returns or from the Official Returns of the various British Possessions.

REMARKS.

(a) Of this total, £38,293,738 was ordinary expenditure, and £3,402,575 was expenditure under the Naval Works Act, 1903 (outside Navy Votes).

(b) Including the Isle of Man and Channel Islands.

(c) The rupee has been converted into sterling at the rate of 1s. 4d. the rupee.

(d) Including £100,000 contribution towards His Majesty's ships on the East Indian station. The balance represents expenditure on the Marine Department.

(e) Exclusive of some vessels of small tonnage registered under the Indian Act X. of 1841.

(f) The Revenue figures given for each State include the sums collected by the Commonwealth Government.

(g) Including the tonnage of vessels (2,296,053 tons) engaged in coasting voyages terminating beyond the State.

(h) The revenues of these Colonies are exclusive of loans raised.

(i) Excluding Inter-State shipping. The figures are not comparable with those given in previous issues of this return, as in 1904 the shipping returns were compiled by the Federal Government for the Commonwealth as a whole, and not by each State as in former years. In years prior to 1904, vessels trading between more than one State, and places outside the Commonwealth, were included in the returns of *each* of those States.

(j) Exclusive of the tonnage of transports.

(k) Including the value of diamonds and raw gold, the produce of South African Colonies, brought into the Colony overland, and exported by sea.

(l) Including the value of goods entered for removal to other South African Colonies.

(m) Exclusive of the tonnage of vessels (7,252,661 tons) trading on the rivers and lakes between Canada and the United States.

(n) As estimated by the Canadian authorities.

(o) Including native craft.

(p) Excluding Inter-State trade.

(q) This amount is made up as follows:—

	£
Contribution to the Imperial Navy in the year ended 31st March, 1905	85,812
Estimated expenditure on Naval Forces for the year ended 30th June, 1905	47,025
Estimated expenditure on Ships and Armaments for the year ended 30th June, 1905	10,114
Total	142,951

The difference in dates is accounted for by the fact that the financial years of the United Kingdom and of the Australian Commonwealth do not end on the same date. The normal contribution from the Australian Commonwealth is £200,000.

(r) This amount is made up as follows:—

	£
Contribution to the Imperial Navy in the year ended 31st March, 1905	40,000
Actual expenditure on the training-ship "Sparrow" for the year ended 31st March, 1905	742
Total	40,742

(s) The contribution from Newfoundland in respect of the maintenance of a branch of the Royal Naval Reserve in the Colony includes the sum of £1,693 received in respect of the year ended 31st March, 1904.

(t) Figures for the year ended June, 1904, are not available.

NOTE.—Except where otherwise stated, the figures refer to 1904. Where it has not been found possible to give the particulars for 1904, the figures for the latest year available have been shown.

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine (a).	Annual Clearances of Shipping in the Foreign Trade (b).	Annual Clearances of Shipping in the Coasting Trade (b).	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
	£	£	Tons.	Tons.	Tons.	£	£
Russian Empire	11,827,431	258,723,000 (p)	666,417	11,364,843 (d)	19,820,006 (d)	35,329,000 (e) (f)	78,313,000 (e) (f)
Germany ...	10,567,342(c) (Year ended 31st March, 1905)	81,137,000 (Year ended 31st March, 1905)	2,322,045 (1903)	16,349,271 (1903)	4,629,244 (1903)	391,720,000 (g)	285,014,000 (g)
Netherlands ...	1,437,236	14,199,000	400,000	10,864,356	No Returns	Metric Tons. 14,990,000 (h)	Metric Tons. 4,327,000 (h)
France ...	12,513,143	144,425,000	1,235,341 (1903)	20,104,388 (1903)	7,464,266 (1903)	185,298,000	149,247,000
Portugal ...	613,158	12,882,000 (Year ended 30th June, 1904)	113,536 (1903)	12,649,360 (1904)	1,235,489 (1904)	11,757,000 (e) (1903)	6,010,000 (e) (1903)
Spain ...	1,052,400	41,331,000	780,559	15,678,067	13,855,089 (1903)	30,145,000	32,883,000
Italy ...	4,840,000 (Year ended 30th June, 1904)	75,913,000 (Year ended 30th June, 1904)	1,044,758 (1903)	24,788,635 (1903)	11,636,070 (1903)	80,295,000 (g)	66,242,000 (g)
Austria-Hungary	2,605,266	<div style="display: inline-block; vertical-align: middle;"> Austria. 72,396,000 (1904) Hungary. 49,612,000 (1904) </div>	<div style="display: inline-block; vertical-align: middle;"> Austria. 259,422 (1903) Hungary. 88,864 (1903) </div>	<div style="display: inline-block; vertical-align: middle;"> Austria. 2,965,254 (1903) Hungary. 1,059,676 (1903) </div>	<div style="display: inline-block; vertical-align: middle;"> Austria. 12,178,829 (1903) Hungary. 1,447,659 (1903) </div>	16,438,000 (e)	15,537,000 (e)
United States (Year ended 30th June)	20,180,310	142,515,000	898,768 (i)	24,191,983 (k)	No Returns	211,440,000	298,382,000
Japan ...	2,209,586 (Year ended 31st March, 1905)	32,066,000 (r) (m) (Year ended 31st March, 1905)	1,126,908 (l)	11,289,406 (n)	No Returns	42,736,000 (m)	45,807,000 (m)

NOTE.—The above particulars with regard to Naval Expenditure have been furnished by the Admiralty. The remaining particulars have been extracted from the Official Returns of the various countries mentioned, except in the case of Russia, Spain, Austria and Hungary, for which countries the particulars relating to Revenue have been extracted from the "Bulletin de Statistique, etc.," 1904-5, published under the authority of the French Minister of Finances.

REMARKS.

NOTE.—The actual Naval Expenditure for any year is seldom known—never immediately—the figures given, therefore are the sums voted.

With regard to the revenue and commerce of foreign countries, in converting the foreign currencies into £'s sterling the approximate par value of the foreign money has been taken.

(a) The figures relating to the tonnage of the Mercantile Marine are given in gross tons in the cases of Portugal, Spain, and the United States, and in net tons in all other cases.

(b) The figures relating to the clearances of shipping are given in gross tons in the cases of Portugal and Spain, and in net tons in other cases. The figures for Spain and Japan include the tonnage of vessels (engaged in the Foreign Trade) calling at several ports in the course of the same voyage, the tonnage of such vessels being taken account of at each port of call.

- (c) The cost of the maintenance of the forts at naval ports is included.
- (d) The figures refer to Russia-in-Europe and the Caucasian ports of the Black Sea.
- (e) Special Trade—i.e., imports for home consumption or exports of domestic produce or manufacture, as the case may be.
- (f) Trade by European sea-board, including also Finland and the Black Sea littoral of Caucasasia.
- (g) Total imports or exports, as the case may be. Imports and exports by sea are not separately distinguished.
- (h) The particulars as to *value* of trade by sea are not available.
- (i) Registered for over-sea (i.e., foreign trade and whale fisheries).
- (k) Exclusive of the tonnage of vessels (5,823,592 tons) engaged in the lake trade between the United States and Canada.
- (l) The tonnage of Japanese vessels is the *gross tonnage* of vessels of foreign type, excluding junks, but including certain sailing vessels of half-foreign and half-Japanese type.
- (m) Including Formosa.
- (n) Includes the Coasting Trade between the open ports.
- (p) Includes a considerable sum raised for war purposes.
- (r) Normal revenue only, exclusive of revenue raised for war purposes.

H. LLEWELLYN SMITH.

Commercial, Labour, and Statistical Department,
Board of Trade,
August, 1905.

BRAZIL.—*Loss of the "Aquidaban."*—The battle-ship "Aquidaban," flying the flag of the Minister of Marine, was lying in Jacarepagua Bay, to the south of Rio Janeiro, with the cruisers "Barroso" and "Tiradentes," having on board the Commission appointed to survey the place for a military port and new dockyard, when at 10.30 p.m. on the 21st ult., from some at present unknown cause, her magazine blew up, and the battle-ship, which had on board 400 officers and men, sank in five minutes, 223 officers and men being lost. The Minister of Marine himself was on board the "Barroso," but Rear-Admiral Rodrigo Rocha, commanding the First Division, with Rear-Admirals Candido Brazil and Calheiros de Graca were among those lost in the ship.

The "Aquidaban" was an armoured battle-ship of about 5,000 tons displacement, and was built at Poplar, being launched in 1885; she was 280 feet in length, with a beam of 52 feet, and a maximum draught of 20.5 feet. She was protected by a 7 feet-wide belt of compound armour from 11 to 7 inches thick, with a central redoubt protected by 10-inch armour, her two turrets being similarly protected. Her armament consisted of four 8-inch Elswick guns, mounted in pairs in turrets, placed *en échelon*, the after turret being on the starboard side; four 4.7-inch 50-calibre guns; eighteen small Q.F. guns, and five torpedo tubes (two submerged). Her engines developed 6,201-I.H.P., giving her a speed of 15.8 knots, which, however, of recent years has been much reduced.

When the revolt of the Brazilian fleet took place in September, 1893, Admiral de Mello, who was supported by Admiral Salhanha da Gama and a number of other naval officers, seized the "Aquidaban," with several other vessels, and for some months blockaded Rio de Janeiro, the troops not having joined the rebels; but the forts at the mouth of the harbour being held by the Government troops, the ships could not get to sea, and in March, 1894, the rebellion came to an end, the leaders

escaping, while the "Aquadaban" was torpedoed by the torpedo-gunboat "Sempaio," and sank in shallow water. She was afterwards refloated, and in 1897 sent to the Vulcan Yard, Stettin, when she was practically reconstructed.

FRANCE.—*General*.—The different ships of the Northern Squadron have been at sea practising their guns in rough weather and taking rolling observations. It is reported that the battle-ship "Henri IV." has a very steady platform, never rolling more than 5°, and that consequently she can work her guns in almost any weather—a quality not possessed by several other ships in the squadron.

A design for a submarine mine dredging craft has been sent from the dockyard at Cherbourg to the Ministry of Marine for consideration. The plans are by Engineer Lacoïn, and embody the experience gained in the operations off Port Arthur.

A school of wireless telegraphy has been organised at Brest, the first course commencing on 1st January.

The transporter-bridge which was taken down at Bizerta in 1904 on completion of the tunnel under the canal, is to be re-erected at Brest, connecting the two sides of the Penfeld.

Relative Rank of Officers in the Navy and Army.—The Minister of Marine has appointed a Commission to consider the pay and allowances of naval officers, comparing the scale with those of corresponding ranks in the Army.

There are three rates of pay in the French Navy:—

1. Service on shore or in ships in reserve.
2. Service afloat in European waters.
3. Service afloat on distant stations.

It will be seen from the following tables that, generally speaking, the Army is better paid than the Navy:—

Pay per Month.

—	Captain in Army.	Lieutenant in Navy.	Difference in favour of Army.
	Francs.	Francs.	Francs.
0 to 5 years ...	292	270	22
5 " 8 " ...	333	300	33
8 " 12 " ...	375	330	45
above 12 years ..	417	378	39

When abroad the difference is still more unfavourable to the Navy, the pay of the military officer when serving in the Colonies being doubled, whereas the naval officer has the same pay as when serving in a fleet in home waters, except that he receives an addition of 1 franc per day messing allowance.

Pay per Month.

—	Captain in Army.	Lieutenant in Navy.	Difference in favour of Army.
	Francs.	Francs.	Francs.
0 to 5 years ...	583	300	283
5 " 8 " ...	667	330	337
8 " 12 " ...	750	360	390
Above 12 years ...	833	405	428

Armament of new Armoured Cruisers.—An alteration of the armament of the two cruisers building, "Edgar Quinet" and "Waldeck Rousseau," has been now definitely decided on by the Minister of Marine.

As originally fixed, their armament consisted of four 194-mm. (7·6-inch) guns in pairs in turrets, and sixteen 164-mm. (6·4-inch) guns. These latter are to be changed for ten 194-mm. (7·6-inch) guns to be mounted, six in turrets and four in casemates. Each vessel will then have fourteen heavy guns of the same calibre. The unification of calibre is one great advantage, but the heavier guns in the light of recent experience will make the vessels much more formidable.

The perforation of the 164-mm. (6·4-inch) gun at 2,000 metres is 255 mm. (9·8 inches), but at the same distance the latest pattern of the 194-mm. (7·6-inch) gun can penetrate 340 mm. (13·3 inches) of Harveyized steel. The perforation and range thus being increased, enables these cruisers to fight an action at a much greater distance and to take a place in a fleet action in line of battle.

The change will not in any way delay the completion of the vessels, as they are not too far advanced for the alteration.—*Le Temps* and *Le Yacht*.

Précis of M. Charles Bos's Report on the Naval Estimates for 1906 (continued). Part II. The Superstructures. — As already stated, under this heading M. Bos includes the masts and military tops, funnels, bridges, conning-towers, and wireless telegraph stations. He considers that the masts in French ships, with their enormous tops, the weight of which is considerable, are far too heavy, and that the following grave disabilities result:—"1. A want of stability due to the excessive top weight; 2. greater visibility at long distances; 3. the offering of an admirable target to the heavy guns of an enemy." M. Bos points out that large superstructures are particularly liable to destruction by heavy shell-fire, and that it is not astonishing that during the Russo-Japanese naval battles the tops in which were mounted the small anti-torpedo-boat guns (additional weight and another cause of instability) were destroyed by heavy projectiles, the result being that when the Russian battle-ships and cruisers had to repel the attacks of the torpedo-boats they were obliged to employ their large guns, their smaller ones being all out of action. In the battle of the 10th August the foremast of the "Tsarevitch" nearly came down when struck by a 12-inch shell; if it had, it would have crushed probably a hundred men, damaged the turrets and conning-tower, and jeopardised the battle-ship herself to such an extent that she might not have been able to reach Kiao-Chau.

M. Bos considers the only logical thing to do is to put the whole of the small guns, whether 4-inch, 12- or 3-pounders, grouped in batteries protected by armour, below the upper deck. Fighting tops will then become useless, and two signal masts, each carrying a range-finder and electric light, will be sufficient.

Coming next to the question of the funnels, in his opinion they are too lofty and offer too good a mark for the enemy's gunners. In the battle of the 10th August the funnels of the "Tsarevitch" and "Askold" were much damaged by fragments of shells, which found their way, many of them, down into the boiler-rooms, damaging pipes, etc. The result for the two ships was at once: 1. An insufficiency of draught; 2. Volumes

of smoke which smothered the decks and blinded the crews; 3. A tremendous consumption of coal; 4. A considerable diminution of speed—from 12 knots to 4 knots in the "Tsarevitch" and from 21 knots to 12 knots in the "Askold." An attempt was made to use forced draught, but it failed, partly because the stokers were unskilled, partly because the hatches and doors were damaged. M. Bos concludes that it is necessary to lower the height of the funnels, to increase the number of the boilers, as has been done for some time, or to be content with a very small modicum of forced draught for high speed. It will be necessary to give up forced draught with closed stokeholds and to substitute induced draught (*tirage forcé en cendrier*), as is used in the mail steamers. This system can be used at once without any closing of the hatches. Lastly, the adoption of armoured gratings for the hatchways of the funnels seems to be absolutely essential in order to prevent fragments of shells falling into the stokeholds and damaging the boilers and pipes, as happened on board the "Tsarevitch."

He thinks that in future the bridges must be reduced to a minimum both in height and size, while the conning-towers are badly designed and badly constructed. In action it is only too probable there will be confusion in the transmission of orders; moreover, the conning-towers are insufficiently protected, and must be much more heavily armoured in order to avoid what happened in the "Tsarevitch," when the conning-tower was almost completely destroyed by a 12-inch shell bursting inside it. In regard to the wireless telegraphy station, in all the new ships it must be installed below the armour deck, as in its present position it will be destroyed before the ship has been in action many minutes.

Coming to the question of the engines and screws, M. Bos states he has no important observations to make in regard to the former, as the vertical triple-expansion engines constructed in the large dockyards and by the large engineering firms give complete satisfaction.

But the question asked last year must be again repeated this: Why do we still continue to fit our large ships with three sets of engines and three screws? This system, adopted by M. Bussy, at one time Head of the Technical Section, has been subjected to much hostile criticism, and has been given up in foreign Navies, except in the German.

M. Bos quotes from the speech of Sir W. White, delivered before the Society of Civil Engineers in November, 1903, in which, after pointing out that the United States, Italy, and England have all refused to construct ships fitted with triple engines and screws, Sir William declared that "up to 40,000-H.P., twin screws give better results than three. Three sets of engines are very cumbersome and consume a large quantity of coal, much in excess of the consumption of twin-screw engines.

"Another argument of the partisans of three screws is that at certain cruising speeds, one or more of the engines can be thrown out of work, and in this way losses by engine friction, condensation, etc., would be avoided and coal economised. This is a mistake, as we have shown in our trials. First, all three engines were made of equal size, and this is still the general practice. It was intended that at low speeds only the centre engine should be at work, and that the two side screws should be disconnected and allowed to revolve. On trial, I am credibly informed, and can well believe, the 'drag' of the wing screws added so seriously

to the resistance that the power required for a given speed was from 40 to 50 per cent. greater than that required when the centre screw was stopped and the side screws worked. Obviously, under these circumstances, the centre screw also caused a 'drag,' and more power was needed than in a purely twin-screw ship."

"We have ourselves pointed out," M. Bos continues, "that in order to obtain a speed of 22 knots, our large cruisers have between 30 to 45 feet greater length than similar foreign cruisers, and are obliged to develop about a third more H.P. to do it. These enormous differences are evidently due to the shape of the hulls of our ships and the employment of three engines."

* * *

"The larger number of engineers of our Navy that we have consulted condemn the triple-engine and triple-screw system, and they hold entirely with the views of Sir W. White on this question. The suppression, then, of the third set of engines and screw could be made without inconvenience.

There would then result, besides a reduction of the officer *personnel*:—

1. An economy in expense;
2. An economy of space;
3. An economy of weight;
4. An economy in fuel.

If the economies thus effected could be devoted to the armament, ammunition supply, and additional coal stowage, we should add to the power of our ships, while at the same time increasing their radius of action."

M. Bos then quotes some of the arguments advanced both for and against the triple-screw system, and points out that in the case of the new armoured cruiser "*Léon Gambetta*," whose trials are quoted by the Technical Section of the Ministry of Marine as having been extremely satisfactory, she having attained a speed of 23 knots (22 knots only having been demanded by the contract), the results attained were still very inferior to those reached by the twin-screw cruisers of the "*Drake*" type.

* * *

M. Bos next proceeds to discuss at considerable length the question of the best type of boiler, and the advantages or otherwise of the small over the large-tube boilers. He points out how the small-tube boilers were first fitted to vessels of small displacement, such as destroyers and torpedo-boats, not only in France but also abroad, and that they are particularly suited to destroyers and torpedo-boats, as steam can be so rapidly and easily raised in them; but they have the disadvantage of not having a long life owing to the high combustion to which they are subjected.

Large-tube boilers were, on the other hand, installed in large ships, where they have proved very satisfactory; but in 1900 it was determined to try small-tube boilers in large ships as well, and since then a struggle between the advocates of the two systems has been going on.

The advantages and disadvantages of the two systems are thus summarised:—

*Small-tube Boilers.**Advantages.*

Facility in rapidly reaching and maintaining a very high rate of combustion up to 350 kg. (771.4 lbs) per square metre of grate surface and more.

Disadvantages.

Encumbrance;
 Multiplicity in the shape and length of the tubes;
 Necessity of the employment of high combustion;
 Rapid wear and frequent accidents;
 Difficulty in sweeping and maintenance;
 Very great fatigue for the stokers;
 Considerable expenditure of coal when steaming (due to difficulties in sweeping), and diminution in sphere of action;
 Consequently, system costly.

*Large-tube Boilers.**Advantages.*

Less cumbersomeness, from which results the possibility of employing low rate of combustion;

Fewer tubes all of the same length and shape;

Less rapid wear and fewer accidents;

Facility in sweeping and maintenance;

Smaller consumption of coal;

An increase, when compared with the other system, in radius of action;

Consequently, system less costly.

Disadvantages.

The impossibility of practically exceeding the rate of combustion of 200 kg. (440 lbs.) per square metre of grate surface (a rate easily maintained by the *personnel* for a long time).

With either system, steam can be raised with great rapidity.

All these *data* have been known for a long time, and the reports of commandants of ships fitted with small-tube boilers fully confirm them.

The Council of Works was formally opposed to the employment of small-tube boilers in large ships, and protested when, in 1895-1896, it was decided to fit them to the large cruisers "*Jurien de la Gravière*," "*Jeanne d'Arc*," and "*Montcalm*"; but in 1900 they somewhat changed their view, and reported that from the technical point of view, small-tube boilers might for the time be fitted to large ships. It was therefore through that decision the armoured cruiser "*Jules Ferry*," of the 1900 programme, has been fitted with small-tube boilers, but she is not yet in commission.

This decision of the Council disquieted the technicians. The Chief of the General Staff, in his evidence on 7th December, 1904, before the Extra-Parliamentary Committee on the Navy, quoted a passage in the Report of Engineer-in-Chief Maurice for 1900:—

"Small-tube boilers have not yet been practically tried in large ships, but from the numerous repairs which it has been necessary to make in ships of the fleet which have come under my notice, and the trouble they give in small ships, it is to be hoped the Navy will not

have to regret having entered on the path of fitting large ships with them."

M. Bos then refers to the unfavourable results obtained in the "Jeanne d'Arc," "Chateaurenault," "Montcalm," and "Jurien de la Gravière," particularly in the first-named ship, which, although designed for a speed of 23 knots, has never been able to exceed 21.7 knots; and he comes to the same conclusions as were arrived at by the late Minister of Marine, that both from the fighting as from the economical point of view, the advantages are enormously on the side of the large-tube boilers, which is also borne out by the fact that the large-tube boilers have been adopted in the English, Japanese, Italian, and United States Navies.—*Rapport du Budget Général de l'Exercice, 1906 (Ministère de la Marine).*

(To be continued.)

UNITED STATES.—*The New Turbine Torpedo of the United States Navy.*—It is always difficult to ascertain just what other Navies are doing in torpedo work, because special secrecy is maintained with regard to what is still considered to be one of the deadliest forms of naval warfare; but the new turbine torpedo, known as the Bliss-Leavitt model, which has recently been adopted by the United States Government, furnishes the American Navy with what is probably the speediest and most effective weapon of the torpedo type in existence.

The new weapon conforms in its external appearance and in the leading features of its internal sub-division and method of control to the Whitehead torpedo; but in size, power, speed, range, and accuracy it far surpasses it. The Whitehead of the standard type as used in the United States Navy has a speed of 28 knots at a range of about 1,200 yards, and about 22 knots at 2,000 yards. The new torpedo has a range, guaranteed by contract, of 3,500 yards, and its speed is 28 knots at this range and 36 knots at 1,200 yards range. The United States Government has been so well satisfied with the new weapon that contracts amounting to several millions of dollars have been awarded for the construction of this type of torpedo, which, from this time on, will be the only type used in the Navy. Two sizes are being made, one, 18 inches in diameter, which can be fired from the existing 18-inch tubes on our battle-ships and torpedo-boats; and the other, a much larger and more powerful torpedo, 21 inches in diameter. The 18-inch torpedo of the new type has an effective range of 2,000 yards and a speed of 33 knots, and 100 of this type have been contracted for, while of the larger 21-inch, 300 are called for by the contract. Thirty of the 18-inch and two of the 21-inch have been delivered at the torpedo station at Newport, where officers and men are instructed in torpedo work under probable war conditions.

The new 21-inch type consists essentially of three sections. First, the head containing the explosive; then the central flask, in which the compressed air for driving the torpedo is stored; and last, the after body, which contains the turbine for operating the propellers, the immersion chamber for regulating the depth of the torpedo beneath the surface of the water, and the gyroscope gear, by which the torpedo is automatically steered and maintained on its proper line of flight.

The head is a beautiful specimen of hammered sheet-metal work. It is formed in two halves, divided longitudinally, the edges of the

joints being made with a square, saw-tooth form and brazed together. The war head, which, as distinguished from the practice head, is used only in actual hostilities, is loaded with 132 lbs. of gun-cotton, containing 25 per cent. of moisture. The gun cotton is packed in disks through the centre of which is a hole that contains a cartridge primer of dry gun cotton for detonating the charge. The small propeller carried at the extreme point of the torpedo is for preventing premature explosion, which it does by locking the firing pin. When the torpedo enters the water, the revolution of the propellers releases a sleeve, which uncovers the firing pin, putting it in position to strike the detonating primer the instant that the torpedo finds its mark. The central body or shell of the torpedo occupies a little more than one-half the total length. It is made of a special forged steel of an elastic limit of at least 90,000 lbs. The rough forging is over 1½ inches in thickness, and it is bored and turned down in the lathe to a finished thickness of 7-16th of an inch. The "flask," as the central portion or air chamber is called, is to the turbine engine of the torpedo what the boiler is to the reciprocating engine of a steam-ship. It is charged at an initial pressure of 2,225 lbs. to the square inch.

The after portion of the torpedo, or the tail, contains in its forward end the wonderful little torpedo engine which drives the propeller. It is of the Curtis compound type, and consists of a central row of fixed blades and two wheels, one 11½ inches and the other nearly 12 inches in diameter. There are two propellers, adapted to run in opposite directions, one being fixed upon the central shaft and the other upon an enveloping outer shaft. The turbine runs at a speed of about 10,000 revolutions per minute, which is reduced by suitable gears to a speed of 900 revolutions for the propellers. At this speed the turbine developed about 160-H.P., the corresponding speed being 40 knots an hour, although the contract speed required by the Government is only 36 knots.

Immediately astern of the compartment containing the turbine is the wonderfully ingenious and delicate apparatus for maintaining the proper depth of immersion and for steering. The regulation of the depth is effected by means of a vertical diaphragm, on one side of which is the water, which is allowed to enter by holes provided in the shell for that purpose, and on the other side a series of coiled springs, the water pressing against the diaphragm on one side, and the springs pressing the diaphragm in the opposite direction on the other side. The springs are adjusted so that their pressure shall exactly equal the pressure of the water at the given depth at which the torpedo is to travel. If the torpedo descends below that depth, the water pressure, overcoming the spring pressure, pushes the diaphragm inwardly. If the torpedo is above the desired depth, the springs overcome the water pressure and push the diaphragm outwardly. The centre of the diaphragm is attached to certain levers and rods, which pass through the tail of the torpedo and act on a pair of horizontal rudders, throwing them up or down, according as the diaphragm is pressed inward or outward, and thus correcting the deviation of the torpedo from the horizontal plane at which it is designed to travel.

Astern of the immersion chamber is located the steering gear. This is a modification of the principle employed in the Obry gear, and depends upon the well-known tendency of a gyroscope to maintain itself in its original plane of rotation. The Obry gear was given its high velocity by means of a coiled spring, which was released at the moment of firing.

In the Bliss-Leavitt torpedo the spring is dispensed with, and a small reaction turbine is used in its place. This consists of a disk with a series of discharge orifices arranged tangentially to the circumference, which are fed with compressed air. The air rushing from the orifices reacts on the disc, and turns it exactly in the same way as did the pipes on Hero's original turbine of two thousand years ago. If the torpedo tends to deflect to the right or to the left, this little gyroscope turbine maintains its original position, and its angular motion with regard to the torpedo (or, to speak more accurately, the angular motion of the torpedo about the gyroscope) serves to actuate a very ingenious mechanism, which turns the vertical rudders to the right or left, and corrects the deviation. The turbo-gyroscope is driven at a speed of 18,000 revolutions per minute.

Of course, the most interesting feature in the building of the new torpedoes is the construction of the wonderfully efficient little turbine engine that drives them. The Bliss Company has designed a very effective machine for cutting the buckets of the turbine wheels. The whole wheel is made out of a single disc of steel, the buckets being integral with the wheel. The machine for cutting the buckets resembles a double-spindle lathe. The work is held in a horizontal position on the tail stock, and two cutters alternately advance toward the rim of the wheel, make a cut of the desired curvature and recede, leaving the wheel free to revolve sufficiently to bring the next bucket into position for another cut. One cutter operates on one wall of the bucket, and the other on the opposite wall. The result is a wheel of perfect form, carrying a highly finished surface. It should be mentioned here that the remarkably high efficiency in speed and range of the new torpedo is due to the use of a superheating process applied to the compressed air. This consists of a flame which is automatically ignited the instant the torpedo is launched from the tube, and which burns during the entire run. The compressed-air flask contains a burner or pot, the flame of which is fed automatically with alcohol. The flow is so regulated that an even and steady temperature is maintained in the air flask.

During the past few months the company has been carrying out a series of very exhaustive tests on board the proving steamer "Sarah Thorpe," which is anchored in the secluded waters of Noyak Bay, near Sag Harbour, Long Island. Here each torpedo is tested and brought up to the required standard of efficiency in speed and range before being turned over to the torpedo station at Newport. The Navy Department assigned a lieutenant and several gunners to witness and record the run of each torpedo. The target is a submerged net 100 feet in length, which is located 1,200 yards from the point of fire. The torpedo breaks through the meshes, and after each shot the net is hauled up and the exact striking point is located by the tear in the net. The maximum deviation in the range allowed is 15 feet to the right and left of the bull's eye, and 30 inches above and below at 5 feet of depth. Each torpedo must come within these measurements in three out of five trial runs in order to be accepted. The average speed of the run is 36 knots, and the time run is about 60½ seconds for 1,200 yards. The cost of the 18-inch torpedo is about 5,000 dollars, and the 21-inch torpedo costs proportionately more.—*Scientific American*.

MILITARY NOTES.

HOME.—The following are the principal appointments which have been made :—

The King has been pleased by Letters Patent under the Great Seal bearing date 19th December, 1905, to appoint:—

The Right Honourable Richard Burdon Haldane, Lieut.-General the Honourable Sir Neville Gerald Lyttelton, K.C.B., Lieut.-General Charles Whittingham Horsley Douglas, C.B., Lieut.-General Sir William Gustavus Nicholson, K.C.B., Major-General Sir James Wolfe Murray, K.C.B., Newton, Earl of Portsmouth, and Thomas Ryburn Buchanan, Esq., to be His Majesty's Army Council.

General—General C. J. McMahon (late Madras) to be Colonel-Commandant, Royal Artillery.

Major-Generals—Major-General R. Auld, C.B., from a Director at Headquarters, to Command an Infantry Brigade. Major-General Sir O'M. Creagh, V.C., K.C.B., I.A., Commanding 5th (Mhow) Division, to be a Lieut.-General in the Army. Surgeon-General L. D. Spencer, M.D., C.B., ret. I.M.S., to be Hon. Surgeon to the King.

Colonels—Colonel F. Hammersley, an A.A.G., is granted the temporary rank of Brigadier-General. Colonel E. W. Herbert, C.B., Commanding the Rifle Depot, to be also Colonel in Charge of Records, Rifle Grouped Regimental District. Colonel F. Rainsford-Hannay, from an Assistant Director at Headquarters, to be a Chief Engineer. Colonel A. J. A. Wright, C.B., from a Colonel in Charge of Infantry Records, to be a Brigadier-General, to Command a Grouped Regimental District, and is granted the temporary rank of Brigadier-General whilst so employed. Lieut.-Colonel and Brevet Colonel L. B. F. Friend, from h.p., to be an Assistant-Director at Headquarters, and to be granted the substantive rank of Colonel in the Army. Colonel W. B. Slaughter, from the R.A.M.C., to be Surgeon-General. Colonel W. S. Pratt, M.B., from the R.A.M.C., to be Surgeon-General.

GERMANY.—*The New Musketry Regulations.*—In a general way the text of the new Musketry Regulations is similar to that of its predecessor of 1889. It must be remembered that the German Army has at the present time two rifles actually in use—the 1888 and 1898 models. The regulations have therefore had to take this into account; the gradual disappearance of the former rifle has necessitated special regulations, which are printed in italics in Roman type, and thus at once catch the eye. The chapters which have undergone the most important alterations are those regarding instruction shooting, and especially as regards battle-firing.

Chapter I., on the theory of musketry, is greatly simplified. "The man," it says, "should have a knowledge of the theory of musketry in order that he may obtain a maximum effect from his weapon. There is no necessity for his being able to repeat theoretic explanations; but he must be made to understand what is of importance for him to know."

Chapter II., as in the former regulations, deals with targets, matériel, and ammunition.

The *Ringscheibe* (targets with circular bullseye), employed for instruction in firing, alone remains unchanged. All the other targets have been altered with the object of presenting to the marksman objectives as closely resembling as possible those met with in war. As a rule the height of all the figure targets has been decreased, so as to take into account the tendency to get under cover; the greater flatness of the trajectory, on the other hand, militates against causing these alterations to make the shooting too difficult. Thus: the head target (*Kopfscheibe*) has been reduced from .35 to .30 metre (13.77 to 11.81 inches); the head and shoulders target (*Brustscheibe*) has been reduced to .50 metre (19.68 inches); the kneeling target (*Kniescheibe*) has been reduced from 1.20 metres to .80 metre (47.2 to 31.49 inches); the whole-figure target (*Figurscheibe*) has been reduced from 1.70 metres to 1.40 metres (66.92 to 55.11 inches). The old aiming trestles have been done away with, the new regulations ordering the exclusive use of sandbags for firing from a rest.

Companies at full strength get 28,000 cartridges a year, weak companies 25,000, of which 11,200 and 10,000 respectively are for battle and instruction firing, 500 for officers, 1,300 or 1,200 for inspections, and the remainder for instruction, rifle meetings, and for adjustment of weapons.

Chapter III. contains hardly any changes, and is devoted to the instruction *personnel*.

Chapter IV., which in the former regulations was entitled "Progress of Instruction," is now called "Musketry Training," and lays down a progressive, rational method of instruction, taking into account the personal qualities of the soldier. At the same time, the regulations especially insist that musketry instruction must be carried out with a view to war, even before the end of the training. They allow the greatest possible initiative as regards the methods of instruction: "The soldier should be taught by a careful and thorough training to recognise all the advantages of ground at a rapid glance, and to make use of them both for firing under the best possible conditions and for taking cover."

Chapter V. is devoted to judging distance, and differs slightly from the former regulations; it is simplified. Taking into account the greater precision of weapons, the new regulations increase the range of the judging-distance practices, viz., to 800 metres for close ranges; to 1,200 metres for medium ranges; and to over 1,200 metres for long ranges.

Chapter VI., entitled "School Firing," contains, under the heading "Sundries," certain innovations of a nature to favour the practical teaching of musketry. Thus, the order limiting the number of extra cartridges to be distributed amongst bad shots has been abolished; according to the new regulations the instructor has in this regard the greatest liberty of action. This chapter lays down that before the commencement of class firing the men of all the classes should fire a few shots at 150 metres against a circular target and sitting at a table for aiming. The object of this regulation is to teach the man to know the peculiarities of his weapon. The conditions required of all classes have been considerably modified. Firing at 500 and 600 metres has been abolished; the maximum distance for the school firing is 400 metres. The number of exercises has been reduced.

Chapter VII. on musketry prizes contains no changes, with the exception that at rifle meetings the firing is no longer carried out standing, but lying down.

Chapter VIII., regarding battle firing, is the one which has undergone the most important changes. Individual firing is limited to short ranges up to 800 metres. The different kinds of fire laid down are:— 1. Preparatory Firing (*Vorbereitungsschiessen*); 2. Group Firing (*Gruppenschiessen*); 3. Section Firing (*Zugschiessen*); and 4. Firing of larger units (*Schiessen in grösseren Verbänden*). As regards the conduct of fire, the regulations express themselves as follows:—"It would be contrary to the characteristics of modern infantry fighting to set a limit to the rôle to be played by every commander. The thorough training in peace time should guarantee, on the day of battle, the co-operation of all in one common object. The commander should not permit himself to be distracted from his high mission by occupying himself with details. Such a training should be given to an inferior commander as will render him capable of acting with initiative and decision, and to take upon himself, on his own responsibility, to emerge from his sphere of command when the situation of the battle demands it." Speaking of the opening of fire, the regulations specially lay down that "the fact of opening fire too soon reveals a lack of calmness and self-confidence," and that "inefficacious fire increases the confidence of the enemy." As regards the conduct of fire, the regulations insist on the necessity of exercising the greatest care in the transmission of orders. The subject of the selection of objective—a question frequently discussed—as to whether sights should be altered in firing on hostile reinforcements, is settled in the following phrase:—"It must not be forgotten that reinforcements for the skirmishing line must pass over a zone covered in its entire depth by a hail of bullets."

The regulations recommend an attentive observation of the efficacy of the fire. "Commanders should judiciously select their positions with a view to exercising the best possible influence on the men. This immediate action of the commander, however, is less powerful and easier to carry out than that moral influence and *example* which should, under all circumstances, give a man calmness, confidence, firmness, and *sang-froid*. These are results that can only be obtained by careful training in peace time."

The rules with regard to the execution of battle-firing are, in part, new. In order that the conditions under which these battle practices should as closely as possible resemble reality, the regulations recommend the use of *Fallscheiben*, or falling targets, and so to take into consideration the efficacy of the enemy's fire by selecting a certain number of men to represent casualties. "To give more interest to battle-firing," say the regulations, "a species of rifle meetings may be organised between two units firing respectively on their own objectives. The following procedure may be adhered to: each time a target is hit by the men of one of the units and falls, a man of the other unit can be put out of action, and *vice-versâ*."

It is strictly laid down that officers and men must act as in war, and must never endeavour to obtain a higher percentage by making use of methods inadmissible in reality. Group firing accustoms the skirmishers to fire discipline. "This species of fire," says the regulations, "should be carried out as carefully as possible, and in accordance with the varying phases of the battle on long lines of skirmishers; it is the action of the subordinate commanders which can make itself most directly felt."

The regulations insist on the representation of situations in isolated actions, especially in action against infantry, and add that even in these exercises the regular technical details of firing, such as loading, adjusting the sights, aiming, etc., must never be neglected.

The *Militär-Wochenblatt* gives its general appreciation of the new regulations in the following terms:—"They entirely fulfil all modern requirements as regards the thorough instruction of the individual marksman, as well as the training for war of both officers and men; they will be of the greatest possible advantage to our infantry, and will certainly contribute and add still further to the combative value of that arm."—*La France Militaire*, *Revue du Cercle Militaire*, and *Militär-Wochenblatt*.

JAPAN.—*How the Japanese Fight*.—Lieut.-Colonel H. A. Reed, A.C., U.S.A., has translated from the *Memorial de Artillerie* of May, 1905, for the Second Division, General Staff, the following interesting observations by Lieut.-Colonel Masahito Kasoi Mura, of the Japanese General Staff, Tokio:—

"We, the Japanese, found in the three great Continental Powers of Europe—Russia, Germany, and France—three different grand types of national character. The Russian is naturally inclined to the use of the bayonet, and still considers the rifle as only a handle for it, although in actual warfare not more than seven per cent. of the wounds are made by it. France, notwithstanding its impetuosity, retains a tendency toward the defensive, with very perfected technical means, which its new regulations show in spite of their aggressive appearance. The mowing fire by which the artillery hurls its gigantic masses of iron is executed blindfold. Germany, finally, is by nature a combatant imbued with the offensive, but is strictly observant of method, so its mode of action might be defined as reflected audacity. This should be to us the most congenial mode because of our disposition. The events of 1870 led us to elect the Germans as instructors; very soon we recognised the close resemblance of our natures.

Savages have no technique, neither are they possessed of nervousness. Civilisation assures the means, but also weakens the physical capacity for resistance. But we, the Japanese, have the advantage of technique without having nerves. With us everything is by rule, which gave us at the beginning of the war the reputation of being absurdly pedantic.

In our methods of attack we believe we have advanced a little beyond European methods by the application of field fortification to the attack. This does not serve us for defence, but assures us a point of rest during the forward movement. On the skirmish, or firing line, one fires while the other digs—a rifleman is immediately followed by a sapper. We work in a manner distinct from that of other Armies. Our agile soldiers dig while lying down. They offer no target to the enemy, and excavate without being seen in the most advanced positions; the succeeding files find a shelter already made. Since these fortifications exist at each stage of the attack, we can dispense with strong reserves. In Germany for an attack only the reserves fortify; work with spade is only done at night when men can work standing, and only as an auxiliary means of defence. As we dig while lying down, we can entrench ourselves during the daytime, and an enemy attacking our front, although he may be superior to us, can do nothing to us without artillery.

Movements to the rear are executed at night, as well as grand operations against the enemy. In time of peace battle exercises are had at night in great silence with the aid of signals made by an officer with a pocket dark lantern always ready for use. All this constitutes only the means to attain the object, and this object is forward until the enemy is overcome. Our technique must sustain the attack, but never leads us

to the defensive. According to this principle we follow the German system of artillery fighting, not the French; the batteries are united in masses and fire normally, but they will not uselessly waste ammunition against a supposed enemy spread over a large space, and that has not been discovered. Rather than fire at woods and covered places we prefer to change position.

During the present campaign we have never been servile imitators, and in this ours resembles the German system.

From a moral point of view the highest ideals sustain the fighting forces of our country. Each soldier up to the last moment knows that he is fighting for a grand idea, and this makes him invincible. It is the enthusiasm for the Emperor which animates the entire Army. In France, in 1870, there was no monarch of the national race, but the descendant of an adventitious person who had been preceded by two republican periods. In Russia the institution of the highest imperialism is almost sanctified, but the monarch is of slight consideration, since occasionally he has been assassinated. In Germany we find sentiments analogous to our own. But in our country this sentiment is still more intense, because we honour in the grandson the great deeds of the grandfather. We are not a people without a history as is believed in Europe. We are the aristocrats of Asia, and our ideas are those of the days of chivalry."

Change of Uniform of the Army.—As a result of the experiences of the late war, the field uniform of the Japanese Army has been radically altered. As is known, it was of a dark colour—almost black—for all arms, with trouser stripes distinguishing the various arms, with the exception of the cavalry and the gendarmerie, who wore madder-red trousers with green or black stripes respectively.

In future all the campaigning clothing for all the officers and men will, without exception, be of khaki colour—cloth for winter and linen for summer wear. The form of the cap, which resembled the German, but slightly higher, has also been altered, and is now very like the Russian. The officers' cap is the same as that of the men, without any distinction of rank. The band round it, for the entire Army, is red. The Imperial Guard, which has hitherto been distinguished by a red band round the cap (it was yellow for the Line), will in future wear an ornament representing cherry leaves and blossom on the front of the band, under the star, which is the distinctive badge of the Japanese Army. Trouser stripes are done away with and are replaced, for all arms, by a red piping. The linen trousers have no piping. The buttons are of yellow metal, plain and dull, for the combatant, and of white metal for the non-combatant branches.

The branches or departments of the Service are distinguished from one another by the colour of the collar-tab, which is of black cloth for the gendarmerie, red for the infantry, light green for the cavalry, yellow for the artillery, claret colour for the engineers, blue for the transport, grey-brown for the commissariat, and dark green for the medical and veterinary departments. All corps (regiments, or battalions and companies forming corps) of the Regular Army will wear Arabic numerals on the shoulder-straps; the *Kobi* (Army of Reserve) Roman numerals, and the *Kokumin* (Territorial Army) Roman numerals on the right and Arabic numerals on the left shoulder-strap. The numerals are of yellow metal for combatants and of white metal for non-combatants. There is no difference between the clothing of officers and men except in

regard to the number and disposition of the pockets. For the present, at all events, the officers will retain their full dress and undress uniforms. For daily duty the wearing of out-of-date uniform, in every kind of combination, will be permitted, until worn out, which will cause a great diversity in uniform for some time.

The cloth used by the Army is made in a special manufactory of the War Department, situated at Senji, on the outskirts of Tokio. The linen, for the most part, is imported from Australia.

It is in consequence of the experiences of active service that the definite selection of khaki colour was decided upon. Leaving for the theatre of war in their dark-coloured uniform, the troops of the Manchurian Army wore in 1904, in summer, clothing of khaki linen. The cap was provided with a cover and a neck-curtain of the same shade. From the commencement of the winter of 1904-05 they were given a khaki-coloured cloak with a goatskin collar, and a sheepskin, the outer lining of which was of the same colour. In many corps in the spring and autumn of 1904 a second large roomy linen jumper was worn over the black one, and over the black trousers a second pair of khaki ones. In the spring of 1905 an issue was made to the men of a species of dust-coat of khaki linen, which hid their dark uniforms. This garment was split slightly up the back and was fastened in front by khaki-coloured bone buttons, and had two outer pockets. The last war proved that dark colours could be distinguished at long distances, whilst under almost all conditions of light grey, khaki, and even red (especially if not worn in the cap or on the upper part of the body) blend with surrounding objects. The Japanese cavalry and gendarmerie wear the same madder-red pantaloons as the French cavalry. On foot, wearing their khaki jumper and red pantaloons, they were not more distinguishable at a distance than their comrades clothed entirely in khaki. It should also be noted that in Manchuria, in consequence of the nature of the soil and of the cultivation, the country, for the greater part of the year, wore a duller, more yellow aspect, more similar to khaki colour than would be found in European temperate regions.

With the Russians, at the commencement, nearly all the officers wore white jumpers, which could be seen at great distances; but the dull grey uniforms of their men was not very distinguishable, not more so, at least, than the Japanese khaki. Unfortunately for them the great height of the soldiers and their great awkwardness, which was still further increased by the weight of their equipment, prevented them from profiting as much as the Japanese from ground cover.

Repatriation of the Field Army—Orders for the return to Japan of the Field Army were issued on the day of the ratification of the Treaty of Peace, viz., on the 14th October last. The movements, for which everything had been prepared since the conclusion of the Portsmouth negotiations, were due to commence on the 16th October. The points selected for embarkation are Dalny, Antung, at the mouth of the Yalu, and Gensan, in Korea.

A commencement has been made by repatriating in the order of their arrival on the theatre of war, the formations of the *Kobi* (Army of Reserve) and the men of the *Kokumin* (Territorial Army) who served in various capacities in Manchuria or Korea. The men of the *Yobi* (men of the Army Reserve), will then be brought back, whose retention with the colours may not be considered indispensable; finally, the units of the

Regular Army will be withdrawn whose return will coincide, as far as possible, with the order of their departure from Japan. Thus the 12th Division, which was the first to disembark in Korea in February, 1904, will also be the first to return to its home quarters. It is calculated that within 6 months—that is to say, by April, 1906—the whole of the Japanese Army will be repatriated.

For the evacuation of the bulk of the Army of Manchuria 13 trains a day to Dalny have been provided. They will, as a rule, be reserved for dismounted branches of the Service and for the Staffs. The cavalry, artillery, and transport will march to the point of embarkation. The points for disembarkation in Japan will be Ujina, port of Hiroshima, Moji, in the island of Kin-shin, and Kobe. Huge quarantine establishments have been organised near all these places. After the departure of Marshal Oyama, General Kodama, his Chief of Staff, will remain in Manchuria to supervise the dislocation.

The withdrawal of the Field Army completed, 2 divisions will be maintained in Manchuria to garrison Port Arthur, to occupy the Liao-tung Peninsula, and to guard that portion of the East Chinese Railway taken over by Japan. These will be the 14th and 16th Divisions, which were raised during the war. The corps of occupation will also consist of two newly-formed divisions, the 13th and 15th. It is probable that in addition to the four already newly raised divisions, the plan for the reorganisation of the military forces of Japan will include the formation of three other divisions, which, with that of the Guards, will bring up to twenty the number of the divisions of the Mikado's Army, which, before the war, only consisted of thirteen.

Tent Canvas.—The tent canvas is made of a mixture of hemp and cotton; it is square, each side being 4 feet 10 inches long, and khaki in colour. At the four corners are placed large aluminium eyelet-holes to receive the ends of the tent poles, which are of oak, and consist of three pieces each. On the edges round each of the sides are a certain number of smaller eyelet-holes; on each canvas square, two sides next to one another, a piece of cord is fixed so that the canvas squares may be laced together. Each portion of the tent pole weighs about 5½ ozs., the whole tent pole complete weighing about 17 ozs. The tent pegs, which are also of oak, are 13 inches long, weigh about 1½ ozs., and are pointed at one end.

As a rule each man is provided with one canvas square, two portions of the tent pole, two tent pegs, and a piece of cord, which represent a total weight of about 3 lbs. The pole and pegs are wrapped in the tent canvas, which, rolled to the length of the portions of the tent poles, is placed on the top of the valise, outside and against the great-coat. When the valise is left behind, the tent canvas, rolled round the great-coat, is worn in banderole. In the mounted branches the tent canvas and its accessories are tied to the cantle of the saddle, above the great-coat. The canvas square may also be used by the men as a waterproof covering over their other clothing.

Very commodious and very complete shelters may be constructed for 1, 2, 3, 4, and 6 men from the same number of canvas squares. The best shelter is that for 6 men; the end is made of bundles of straw or dried grass, held together by branches; one end is used as an entrance. Shelter may also be obtained for 35 men by using 24 canvases and 8 supports, 8 of the canvases forming the roof and the others the sides of the shelter. A circular tent for 30 to 40 men may also be made of 24 canvases by making the exterior wall of earth or snow about a foot

wide and about 5 feet in height. The cover requires 15 canvases, the remaining canvases being spread on the ground. As a rule the Japanese soldier is very dexterous at rapidly improvising shelters by means of these canvases and any branches or sticks they may pick up.—*La France* these canvases and any branches or sticks they may pick up.—*U.S. Army & Navy Journal*, *Revue Militaire des Armées Etrangères*, and *La France Militaire*.

RUSSIA.—*The Training and Education of the Army*.—The General Commanding the Varsovie Military District has recently issued an order giving advice and laying down strict regulations on the methods of training and education to be employed. The following is a summary of the same :—

"The war with Japan," the order commences, "has confirmed the enormous importance of the individual preparation of soldiers of all ranks. Whilst rendering justice to our officers and soldiers, who very frequently during this war displayed distinguished bravery, and thoroughly fulfilled their duty, it is impossible but to agree that the individual preparation of officers and men showed very many defects." To obviate them it will be necessary to pay particular attention both to the individual training of officers, non-commissioned officers and men, and to the collective training of the troops.

Individual Training.

a. *Officers*.—It is inadmissible that officers should confine themselves to the study of regulations alone. It is indispensable that they should make themselves thoroughly acquainted with new ideas relative to the tactics of the three arms, and with a knowledge of new technical methods. Corps commanders, responsible for the instruction of officers, should recommend to them the perusal of valuable military works, make them lecture on these works, and by discussion provoke a wide exchange of ideas with regard to them. These lectures, to be organised in every garrison, will be given by infantry, cavalry, and artillery officers, according to the subject dealt with; if necessary, officers will be detached to small garrisons for that object. Tactics of the three arms will be expounded by Staff officers. The special lessons should be drawn from the events of the recent war. Advantage will be taken of the winter to carry out tactical schemes on a map and on the ground by endeavouring to show the inevitable differences between a purely theoretical study on a map and work on the ground. Routine, apathy, and slackness, too often customary with these works, must be stamped out; this is the only way to make them of real value. The object of all instruction for officers should be to increase their confidence in themselves, and to render them fit to take the initiative.

b. *Non-commissioned Officers*.—The greatest care should be taken in the training and education of the non-commissioned officer, "as he is the first assistant and the substitute of the officer; he should by his training be elevated above the level of the men, and be made, in this regard, as near as possible to the officer. Special attention should be paid to the development of his intellect and of his character. They should, above all, be accustomed not to fear responsibility. I think that a non-commissioned officer should be more readily forgiven for small deficiencies in the knowledge of his duty than for indecision: the latter is more frequently the result of a fear of punishment."

c. *The Men*.—Winter should be devoted to the individual training of the soldier. All the physical exercises, except when absolutely im-

possible, should be carried out in the open air; gymnastics should enable the men to surmount all the various sorts of obstacles they may meet with in action. Account must be taken of the want of general instruction amongst the people themselves, and every effort made to rouse the intelligence of the recruits. "The chief object is not so much to teach them to read and write, for it is not a question of making clerks of them, but shrewd, smart fighting men, who do not lose their heads. Instruction in reading and writing is only a means. Constant educational chats by commanders of units and an intimate contact between the officer and each of his men may well serve to increase the intelligence of our soldiers." Field officers should supervise the instruction given to companies, squadrons or batteries, but should not interfere with their progress by useless revisions. Old soldiers should not be made to recommence what they have already learnt. Every fresh year of service should bring fresh knowledge with it. Special attention should be paid by all the commissioned ranks to the reduction to its utmost extent of employed men; preparation for war should come before administration. Employed men should be obliged to attend frequent drills.

Preparation of the Troop, Company, etc.

During the winter all portions of service in the field and battle instruction will be carried on out of doors. These exercises will take place at least once a week. By gradually training the men to the work, their powers of endurance will be increased. All troops in the district, without exception, will carry out day and night marches. In the infantry everyone will take part in them, including recruits kept separate, with the exception of employed men who are absolutely indispensable; in the cavalry and horse artillery, as many men as the number of horses will permit of, all the youngest remount horses being put on one side; in the field artillery, 4 guns and 4 ammunition wagons per battery will be horsed. Every march will be part of a tactical scheme, and will conclude with a manœuvre against a skeleton enemy, or against another force. The length of the marches will be progressively increased, so that, at the end of the winter, infantry will be in a fit state to make regulation marches without fatigue. Reconnaissance and scouting in every form, taking into consideration the practice of the last war, will be carried out during these marches.

In the cavalry, long-distance rides should be organised, profiting in this respect by the manœuvres of neighbouring garrisons. "In addition to the marches, to accustom the men to a life in the open air in severe weather, I order all the troops to carry out two manœuvres of two days' duration, spending one night in bivouac." The choice of the time for these manœuvres is left to the officers who must direct them. As far as possible all three arms will be combined. It is even stated that during these manœuvres the men, instead of receiving bread, will be issued flour, and will themselves cook a species of damper.

In the cavalry at least two regimental manœuvres a month will be carried out, or if the regiment has detached squadrons, with all those that can be got together; detached squadrons will manœuvre singly or by twos under the same conditions. All troops in the district should practice field firing in the snow, so as to accustom the men to judge distance and to the appearance of objects in that sort of weather. Every manœuvre will be followed by a critique, and commanders of army corps and divisions will make written observations on those they have taken part in. They will send in a report at the end of each month of the

manœuvres carried out during that month. They will forward the scheme for the two days' manœuvres in advance to the district staff, and will advise it by telegraph the day before that fixed for the manœuvres. The order concludes by referring to the checks in the Russo-Japanese War, which should excite in the entire Army a determination to devote all its energies to work to wipe out the defects that caused them.—*La France Militaire*.

UNITED STATES. — *Report of Chief of Staff, U.S.A.* — Lieut.-General Adna R. Chaffee, Chief of Staff, U.S.A., in his annual report declares in plain terms that the Army is under-officered for the duties required of it in time of peace, and that in time of war it would be in a decidedly crippled condition for that reason. As a modest measure of relief he suggests that Congress be requested to authorise promotions and appointments to fill vacancies due to the forty-two officers below the rank of general serving on the General Staff, sixty-five detailed to the Military Academy, thirty-four for recruiting service, and two detailed to the Bureau of Insular Affairs of the War Department.

There are twenty-one officers on detached service with the Philippine Scouts, eighteen with the Philippine Government, three with the Porto Rican Regiment, and nine with the Panama Canal Commission, all of whom are performing duties prescribed by law, and whose services will be lost to the Army for many years to come. General Chaffee does not include these in his recommendation as to filling places by applying the law of the detail system to them, but it is his opinion that the efficiency of the troops would be improved if those details could be filled as is done in the case of officers detailed to the various staff departments. Officers much above sixty years of age, officers who have been many years separated from the Army, and officers of colonel and general rank are not suitable for recruiting service for obvious reasons. Some others are indisposed to serve unless assigned to station or section of the country they wish, which is not always possible. There were twenty retired officers doing recruiting duty on 30th June; on 1st November, 1905, there were twenty-eight, which seems to be near the maximum of utilisation under present conditions of availability.

General Chaffee maintains that the experience of the last year has abundantly demonstrated the value of the General Staff, and as his present report will be his last as Chief of Staff, he discusses at some length the work it has accomplished. He explains that for administrative purposes the General Staff has been organised into three divisions. The first division is charged more particularly with administrative matters; the second division with matters pertaining to information; the third division has charge of military education and matters of a more or less technical nature, and its entire *personnel* is also a part of the War College. This statement is supplemented with a general statement of the work performed by each division during the year.

It is pointed out that since the publication of General Orders which authorised discharge, for the convenience of the Government, of men belonging to organisations selected for service in the Philippines, who have less than two years and three months to serve (non-commissioned officers excepted), and their immediate re-enlistment, if the men so desire, with transfer to other commands in the United States as an alternative, regiments have departed prepared for service in the islands for the allotted

time (two years), and return to the United States without material reduction in numbers due to discharge for expiration of service. The result is that the efficiency of organisation for service in the islands, so far as constancy of numbers during the tour affects the question, has been decidedly improved under the operations of the General Orders referred to. The length of the tour of service (two years), says General Chaffee, cannot be advantageously extended with men enlisting for but three years.

It is General Chaffee's opinion that the present system of professional education excels all past effort in the subject. Its chief merit and change is progression and broadening of the curriculum. Officers are no longer required to go over and over the same subject for years. On the contrary, they have only to prove their proficiency in a subject to entitle them to a certificate of qualification, which will excuse them from repetition in any Garrison or Service School; and as these certificates are accumulated year by year they become the best possible evidence of an officer's mental proficiency. From West Point, through Garrison and Service Schools and the Staff College at Fort Leavenworth with credit, requires, and is evidence of, mental effort of a high professional order, and the Secretary of War may be certain that all such are able, conscientious, and efficient officers, prepared for the responsible duties of captains and majors with excellent prospect for success.

With regard to the discipline of the Army, it is pointed out that while the figures as to trials by courts-martial indicate, to the inexperienced, much court-martialing, which is true enough, it should be understood that arbitrary punishment, at one time the rule—that is, where a company officer himself disciplined his men with extra fatigue in various ways for minor offences, such as absence from roll-calls, careless habits, inattention at drills, etc.—is now seldom resorted to in the Service, and in lieu of such practice the custom is to send all these cases before the summary court officer, who applies the remedy specified by the President's order for correction of faults like those mentioned, and others similar and of a graver sort. The record is, that in the Army of more than 60,000 men, 59,439 errors, faults, or offences were observed during the year and taken notice of officially. That there were no more is evidence to the experienced man of the generally good conduct of the great majority of our soldiers.

Noting that desertions from the Army during the year numbered 6,533, General Chaffee estimates that the desertions involved an average loss to the Government of 60 dollars per man, making a total of 391,980 dollars, and adds: "Some suitable legislation affecting the political rights of deserters, and an aroused public opinion that desertion from the military service of the nation is repugnant to the minds of all good citizens, constitute the practical method and the only effectual means, in my opinion, for the material abatement of the crime referred to."

As the result of a very careful consideration by the General Staff in the interests of the Service, with a view to determining the actual situation and requirements of the artillery arm, it is proposed to submit a report and the draft of a Bill to increase the Coast Artillery by a few thousand men (about 5,000 men and the necessary officers), and the Field Artillery also by a few batteries; to provide for the permanent separation of the Field Artillery from the Coast Artillery, and to constitute the former a separate corps and give it regimental organisation. The proposed measure alone will not afford complete relief, but provides what may be regarded as the minimum for efficiency at this time, and is believed to be the least that should be granted. It is needless to remark

as information, it being a self-evident fact, that the annual unfolding of the coast-defence scheme of the country, inaugurated seventeen years ago, requires from time to time, as progress is made in the construction of emplacements and armament, additional *personnel* for the care of guns and *matériel* and the instruction of men in their use.

Speaking of the report of the Chief of Ordnance, General Chaffee says : " All arms of the Service are interested in ordnance *matériel*, and the report of the Chief of Ordnance contains so much information, briefly stated under appropriate sub-heads, that would interest officers of the Line if available to them. It is recommended that pamphlet copy of the report be furnished to each troop, company, and battery commander."

General Chaffee concurs in the recommendation of the Paymaster-General for an increase of commutation of quarters for officers not on duty with troops, at places where quarters are not owned by the United States.

With reference to the detail system as applied to the supply departments, General Chaffee remarks : " As this is the last opportunity that I shall have to remark upon this subject, and though still holding to the view that it is yet too soon to modify the law establishing the detail system, I may say that it is possible it will appear, upon thorough test, advantageous to the supply departments to re-establish permanently 50 per cent. of officers in the grade of major, with subsequent promotion to colonel in the corps or department; captain's rank to be the field of preparation for detail, and the remaining 50 per cent. of field officer rank to be held available for the infusion of a combination of past experience in the department and subsequent Line service with troops, which should ensure greater vigour in field officer grades as a whole than may be expected if all are permanent."

On the subject of the canteen, General Chaffee makes the following comment : " In February, 1889, the Department prohibited the sale of strong alcoholic liquors at posts, but authorised the sale of beer and light wines, under proper regulations. The Act of Congress, approved 2nd February, 1901, discontinued the sale of beer and light wines. The lowest ratio of alcoholism was for the year 1898, when beer and light wines were sold under regulations established by post authority. It is apparent, however, that the war with Spain had much to do with the low ratios shown for 1898, 1899, and 1900, as during those years the Army was in the field, and while fewer canteens were in operation than in 1897, it is obvious that conditions afforded little opportunity for indulgence of any kind." Without expressing an opinion on this subject, pro or con, the Chief of Staff states it as his experience upon the plains, and as the experience of others of the old officers of the Army, that upon starting from camp, canteens filled with water, if the men are cautioned that the march is to be a long one, without probability of finding water *en route*, or with the location of water unknown, an immediate thirst is set up, and the canteens will be emptied a great deal sooner than would be the case if the men were not informed of the prospect confronting them. Prohibition creates in soldiers a wish for drink, rather than banishes it.—*U.S. Army and Navy Journal*.

NAVAL AND MILITARY CALENDAR.

JANUARY, 1906.

- 2nd (T.) H.M.S. "Kent" commissioned at Chatham for China.
 " " H.M.S. "Ocean" commissioned at Chatham for Channel Fleet.
 " " H.M.S. "King Alfred" commissioned at Portsmouth for China Station.
 4th (Th.) 92nd Co. R.G.A. left Ceylon for England in the "Oruba."
 " " 2nd Bn. West India Regiment arrived in Jamaica from Sierra Leone in the "Muraji."
 7th (S.) H.M.S. "Euryalus" arrived at Spithead from Australia.
 8th (M.) "V" and "W" Batteries R.H.A. } arrived in South Africa from
 " " 10th, 26th, and 92nd Batteries R.F.A. } England in the Dilwara."
 9th (T.) H.M.S. "Hermes" commissioned at Portsmouth for East Indies.
 " " H.M.S. "Indefatigable" commissioned at Portsmouth for West Indies.
 10th (W.) H.M.S. "Iphigenia" paid off at Portsmouth.
 11th (Th.) Prince Arthur of Connaught left England for Japan to invest the Mikado with the Order of the Garter.
 " " 3rd Bn. Royal Fusiliers arrived in South Africa from Bermuda in the "Soudan."
 13th (Sat.) H.M.S. "Kent" left Portsmouth for China.
 17th (W.) M. Fallières was elected President of the French Republic.
 18th (Th.) H.M. the King presented a cup to the winners in the Artillery Volunteer Competition.
 19th (F.) 2nd Bn. East Yorkshire Regiment arrived in India from England in the "Ionian."
 21st (S.) Loss of Brazilian battleship "Aquadaban" by explosion of Magazine in Jacarepagua Bay with loss of 223 Officers and Men.
 23rd (T.) H.M.S. "Indefatigable" left Spithead for West Indies.
 " " "N" and "S" Batteries R.H.A. } left South Africa for India
 " " 76th, 81st, and 82nd Batteries R.F.A. } and Mauritius in the
 " " 2nd Bn. Leinster Regt. (Royal Canadians) } "Soudan."
 25th (Th.) H.M.S. "Hermes" left Portsmouth for East Indies.
 26th (F.) 1st Bn. East Yorkshire Regiment left India for England in the "Ionian."
 27th (Sat.) 92nd Co. R.G.A. arrived in England from Ceylon in the "Oruba" and was disbanded.
 29th (M.) H.M.S. "Argyll" commissioned at Devonport for First Cruiser Squadron.
 " " H.M.S. "Monmouth" paid off at Devonport.
 " " H.M. Christian IXth, King of Denmark, died in the Amalienborg Palace, Copenhagen.
 " " 2nd Bn. Leinster Regiment (Royal Canadians) arrived in Mauritius from South Africa in the "Soudan."
 30th (T.) Frederick VIIIth was proclaimed King of Denmark.
 31st (W.) H.M.S. "King Alfred" left Portsmouth for China.
 " " 1st Bn. Northumberland Fusiliers left Mauritius for India in the "Soudan."

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval*. Buenos Aires : December, 1906.—Has not been received.

AUSTRIA-HUNGARY. — *Mittheilungen aus dem Gebiete des Seewesens*. No. 2. Pola : February, 1906.—“The Blockade Operations of the Italian Fleet before Maddalena, of September, 1905.” “Account of the Battle of Tsushima.” “Progress in Naval Gunnery and Armour.” “Foreign Naval Notes.”

BRAZIL.—*Revista Marítima Brasileira*. Rio de Janeiro : September, 1905.—Has not been received.

CHILI.—*Revista de Marina*. Valparaiso.—Has not been received.

FRANCE.—*Revue Maritime*. Paris.—We are informed that this well-known publication, issued under the auspices of the Ministry of Marine, is shortly to reappear. Its non-publication during the last few months has been due to the death of the Editor and the consequent disorganisation of the arrangements connected with its issue.

Questions Navales : Revue Générale de la Marine. Paris : 10th January, 1906.—“The Year 1906.” “A Cry of Alarm.” “The Regulating of the Effectives and of the hours of work of the Crews of Ships of the Mercantile Marine.” “The Problem of Speed and the Struggle for the Empire of the Sea.” “The International Automobile Exhibition.” “The Salon Cup.” “The Renaissance of the English Navy.” 25th January.—“M. Etienne Lamy, Academician.” “The Lesson of Facts and our Naval Programme.” “Our Mercantile Marine.” “The Committee of Ship-owners.” “Naval Automobilm and our Submarines.” “The Artillery Engineers of the Navy.” “The Saint Maixent Naval School for Petty Officers.”

La Marine Française. Paris : January, 1906. — Has, not been received.

Le Yacht. Paris : 6th January, 1906.—“The Report on the Naval Budget and the Programme of New Constructions.” “Yachting Notes.” “The Sardine Crisis.” “The Promotion Lists for 1906.” “Brazilian Light-draught Gun-boats.” 13th January.—“The Naval Education of the Executive Personnel.” “Yachting Notes.” “The New German Armoured Cruiser ‘York.’” “The French Navy in 1905.” “The Suppression of the Submarine Defences.” 20th January.—“The Distribution of our Naval Forces.” “Yachting Notes.” “The French Navy in 1905” (*concluded*). “The U.S. Monitor ‘Florida.’” 27th January. — “We must Concentrate our Battle-ships in the North.”

"Yachting Notes." "The Naval Institute." "Speed and Enveloping Movements."

Le Moniteur de la Flotte. Paris: 6th January, 1906.—"Both?" "The Navy in Parliament." 13th January. — "Discussion Ended." "Ships on Trials." "Commission for the Revision of Pay in the Navy." 20th January.—"Admiral Dupetit Thouars." "Medium Artillery at the Battle of Tsushima." "The School of Gunnery." 27th January.—"The Role of the Destroyer." "Fishermen and *Les Inscrits Maritimes*." "The Navy in Parliament." "The Votes for Naval Works."

GERMANY.—*Marine Rundschau.* Berlin: February, 1906.—"Political and Economic Problems in Canada." "An Examination into the Development of Powder." "On Promotion Conditions among Officers in the U.S. Navy." "Side-lights on the French Fleet." "The Fleets of Argentina, Chili, and Brazil in the last two years." "On the Means for Solving the Alcohol Question in the Navy." "The Development of the Kiao-Chau Territory in the Years 1904-05." "Foreign Naval Notes."

ITALY.—*Rivista Marittima.* Rome: January, 1906. — "Modern Naval Constructions." "For the New Naval Agreement." "Marine Motors and Internal Combustion." "Recent Studies on the Variation of the Dip of the Horizon at Sea." "A New Type of Pressure Gauge." "Collisions." Letters to the Director:—"The Transmission of Orders." "On the Physical Education of the Men of the Fleet." "Foreign Naval Notes."

PORTUGAL. — *Revista Portuguesa, Colonial e Maritima.* Lisbon: December, 1906.—"A New Submarine." "A Japanese Embassy to Europe in the 16th Century" (*continued*). "The Natives in the Province of Mozambique and the Chinese in the Rand Gold Mines." "Travels in Angola" (*continued*). "The Colonial Movement." "Foreign Naval Notes."

SPAIN.—*Revista General de Marina.* Madrid: January, 1906. — "Some Remarks on the Battle of Tsushima." "Official Report of Admiral Togo on the Battle of Tsushima." "Description of the Bergman Regulation Pistol." "Steam Turbines." "The Panama Canal." "Some Considerations on the Promotion Regulations in the Navy." "The Japanese Navy." "Naval Lessons of the War." "Four Years' Experience with Belleville Boilers."

MILITARY.

ARGENTINE REPUBLIC.—*Revista del Boletín Militar del Ministerio de Guerra.* Buenos Aires: December, 1905.—"The Grand Manœuvres." "Progress of the Country." "*Si vis pacem para bellum*: The Lesson of the Manœuvres." "Notes on the General Military History of Latin America." "Some Applications of Physics to Military Science." "Introduction to the Study of Military Administration." "Some Considerations on Military History." "The School of Pinerolo." "The Organic

Military Law." "On Fortification." "The Service of Cavalry in the Field." "Scales of Measurement."

AUSTRIA-HUNGARY.—*Danzer's Armee-Zeitung*. Vienna: 4th January, 1906.—"Retrospect of the Year, 1905." "The Peace Efficiency of Army Commanders." "The Heavy Field Howitzer Question." "Addenda to the 100th Anniversary of the Battle of Austerlitz" (*concluded*). "From the Bulgarian Army." 11th January.—"The Five Annual Courses at the Infantry Cadet School." "Instruction for Military Clerks." "The German '98 Rifle with the 'S' Ammunition." 18th January.—"The Military Deployment at Vilagos." "The Musketry Instructions of the German Army." "Improvement in the Position of the Private Soldier and of the Long-Service Non-commissioned Officer in the Russian Army." "Training of our Cavalry Officers." 25th January.—"Personal Impressions of the Russo-Japanese War from the Japanese Side." "Field Positions and Fortresses." "The *Pallestra* in the Art of Fencing." "How the German *Kriegerbund* could become Great."

Organ der Militär-wissenschaftlichen Vereine. Vienna. Vol. LXXII. Part I. 1906.—"Infantry Fire-Control." "Reorganisation of Field Artillery." "The Japanese in the Battles round Mukden."

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: January, 1906.—"Remarks on the Experimental Determination of the Progress of the Rapidity of Projectiles." "Contribution to the Study of the Battles round Port Arthur." "Electro-Magnetic Guns"

BELGIUM.—*Bulletin de la Presse et de la Bibliographie Militaires*. Brussels: 31st December, 1905.—"The Final British Regulations on Combined Tactics" (*concluded*).

15th January, 1906.—"The French Musketry Instructions of the 31st August, 1905." "Landings." 31st January.—Has not been received.

FRANCE.—*Revue du Cercle Militaire*. Paris: 6th January, 1906.—"The New Year." "At the Russian Staff College." "Report on the Work executed by the Army Geographical Service in 1904." "Small Units in Action—Formerly and To-day" (*continued*). 13th January.—"The new Chief of the Staff of the German Army." "The 1st Artillery Regiment." "Small Units in Action—Formerly and To-day" (*continued*). "An Austrian Opinion on the German Army." 20th January.—"An Austrian Opinion on the German Army" (*continued*). "Small Units in Action—Formerly and To-day" (*continued*). 27th January.—"Report on the Naval Budget for 1906." "An Austrian Opinion on the German Army" (*concluded*). "Small Units in Action—Formerly and To-day" (*concluded*).

Le Spectateur Militaire. Paris: 1st January, 1906.—"The Army is not Commanded." "The Russo-Turkish Campaign of 1877-78" (*continued*). "The Army an Educator by means of Reciprocity." "The Conquest of Ménabé" (*continued*). 15th January.—"The Army is not Commanded" (*concluded*). "The Russo-Turkish Campaign of 1877-78" (*continued*). "The Russo-Japanese War" (*continued*). "The Army an Educator by means of Reciprocity" (*continued*). "The Conquest of Ménabé" (*concluded*).

Revue de l'Intendance Militaire. Paris: December, 1905.—“On the Preservation of Fresh Meat.” “The Army of Egypt, 1798-1799: Administration and Discipline” (continued). “General Information regarding Combustibles liable to be issued to the Army.” “Analyses of Yeast.”

January, 1906.—Has not been received.

Revue du Génie Militaire. Paris: December, 1905.—“The Present Tendencies of Engineers in the Russian Army” (continued). “Kites and their Military Uses” (concluded).

January, 1906.—Has not been received.

Revue de Cavalerie. Paris: December, 1905.—“To Right and to Left.” “The Covering Service in the Campaign in the East, 1870-71.” “Letters to Plok” (continued). “The Ordre de Bataille of the German Army on the 1st January, 1906.” “General of Division Baron Faverot de Kerbrech.”

January, 1906.—Has not been received.

Revue Militaire des Armées Etrangères. Paris: January, 1906.—“Infantry Action in the Russo-Japanese War.” “The Italian Provisional Infantry Drill Regulations.”

Revue d'Histoire. Paris: January, 1906.—“Staffs and Military Cabinets during the Campaign of 1870-71.” “The Campaign of 1794 with the Army of the North” (continued). “The Pursuit of the English Army by Marshal Soult.” “The War of 1870-71: The Army of Châlons” (continued).

Revue d'Artillerie. Paris: December, 1905.—“The German ‘S’ Bullet.” “The Browning Sporting Rifle and Automatic Pistol.” “The Calibre of the Revolver.”

January, 1906.—Has not been received.

Journal des Sciences Militaires. Paris: January, 1906.—“A Study of the German General Staff on the new French Infantry Drill Regulations and Instructions.” “Asia after the Russo-Japanese War.” “Dragomiroff.” “Study of the Combat with a view to determining its Theoretic Form.” “Experience of the Russo-Japanese War.” “Comparative Study of French and German Field Service Regulations” (continued). “The Field Service Kit, and Lightening the Infantryman's Load.” “The War of Succession in Austria, 1740-1748” (continued). “The Military Month.”

GERMANY. — *Militär-Wochenblatt.* Berlin: 2nd January, 1906. — “Musketry Experiments and Experiences.” “A New Weapon.” “New Field Service Regulations in Bulgaria.” 4th January.—“Corps or only Divisional Artillery?” “Infantry Musketry Instruction and Gymnastics.” 6th January. — “The Bullet a Fool, the Bayonet a Man?” “Corps or only Divisional Artillery?” (concluded). “Battle Shooting of Infantry” (continued). 9th January.—“The Employment of Optical Means of Communication in the Herero and Hottentot Rebellion.” “The Bullet a Fool, the Bayonet a Man!” (concluded). “The New Italian Drill Regulations.” 11th January.—“From Tjurientschen to Tawa.” “Intelligence from the Russian Army.” “Infantry Battle Firing” (concluded). 13th January.—“The Importance of the War Game in the Training of Cavalry Officers.” “From Tjurientschen to Tawa” (continued). 16th January.—“In Memory of General Albert von Holleben.” “Once More the Fight against Battery Shields.” “From Tjurientschen to Tawa” (continued). “Intelligence from the Belgian Army.” 18th

January.—"To Field-Marshal Count von Haesler on his 70th Birthday." "From Tjurientschen to Tawa" (*concluded*). "The Great Elector as Teacher of the Army." 20th January.—"Formal Considerations on the Battle of Mukden." "Opinions on a Sturdy Horse for Artillery." "The United States Army in 1905." "On the Development of the Shortening the Period of Service in the Russian Army." 23rd January.—"Frederick the Great and his East Asiatic Commercial Companies." "On the Battle of Beaune la Rolande." "Military Intelligence from Switzerland." 25th January.—"Field Artillery Practice against Balloons." "Frederick the Great and his East Asiatic Commercial Companies" (*continued*). "Observations on the Promotion of Individual Training in the Infantry." 27th January. — "General Zerpitzkij." "Frederick the Great and his East Asiatic Commercial Companies" (*concluded*). 30th January.—Lieut.-General Sir Ian Hamilton's Book about his Participation in the War in Manchuria." "General Zerpitzkij" (*concluded*).

Internationale Revue über die gesamten Armeen und Flotten. Dresden: January, 1906. — "Military and Naval Intelligence from Austria-Hungary, Bulgaria, China, Denmark, France, Germany, Great Britain, Greece, Holland, Italy, Japan, Russia, Servia, Sweden, Turkey, and the United States." *Supplement 69*.—"The German Imperial Manœuvres, 1905." *French Supplement 82*.—"Dangers of Ground Cover." "Consumption and Supply of Ammunition in the Infantry and Artillery during the Russo-Japanese War." "Musketry Instruction in the German Army." "Provisioning of Armies in War." "The Panama Canal from the Naval Strategic Point of View." "The Problem of Fire Superiority." "Submarine Mines." "How should Infantry Advance under Artillery Fire?"

Jahrbücher für die Deutsche Armee und Marine. Berlin: January, 1906. — "The Ammunition Supply of the Field Artillery." "Napoleon, Moltke, and the Fortress." "The Peace-Effective Salaries of Officers." "Review of the Second Silesian War." "Russia's Army and Navy and the Revolution at the end of 1905."

Neue Militärische Blätter. Berlin: December, 1905. No. 23. — "What does the Personality of Frederick the Great teach the Officer with regard to his Military Self-Education?" "The War of 1805 in Germany." "General von Goeben." "On the Formation of a Great German Women's League for the Improvement of Our Navy." "Argentine Officers in the German Army." "Military Echoes." "Military Intelligence." No. 24.—"What does the Personality of Frederick the Great teach the Officer with regard to his Military Self-Education?" (*continued*). "The War of 1805 in Germany" (*concluded*). "Personation." "Military Intelligence." No. 25-26.—"The Crown Prince Grenadier Regiment." "New Revelations with regard to the Tanroffen Convention of 1812." "What does the Personality of Frederick the Great teach the Officer with regard to his Military Self-Education?" (*continued*). "The Present Military Situation on the North-West Frontier of India." "Order to the Troops in the Warsaw Military District." "Firing at Captive Balloons." "The Turbine Question amongst the Principal Powers." "Military Intelligence." January, 1906.—Has not been received.

ITALY.—*Rivista di Artiglieria e Genio.* Rome: November, 1905.—"Firing Exercises of the Coast Artillery." "An Italian Division at the Siege of Colberg (1807)." "On the Use and Methods adopted for Field Artillery Fire by the two Belligerent Armies during the Russo-

Japanese War." "Calculation of the Flow of Magnetic Induction across any Solenoid." "The Walls of Modena" (*continued*).

Rivista Militare Italiana. Rome: January, 1906.—"Some Notes on Military Psychology." "Practical Solutions of Tactical Themes." "French West Africa." "Military Agrarian Instruction." "The Infantry Provisional Regulations: Some Brief Considerations and Suggestions." "Unproductive Charges!"

MEXICO.—*Revista del Ejército y Marina*. Mexico: January, 1906.—"To the Army." "Proposals and Programme." "Firing Lessons." "Military Raids." "Rank and Command in the U.S. Army." "The Entry of Officers in Germany." "Military Schools of the U.S. Army." "The Brazilian General Staff."

PORTUGAL.—*Revista de Engenharia Militar*. Lisbon: November, 1905.—"General Report on the Works carried out in 1904-05." "The Number of Workmen, Development and Time of Execution of Field Fortification Works." "Military Recognition of the Portuguese Frontier between the Districts of Lourenço Marquez, Gaza, Transvaal, and Swaziland, and the Establishment and Provision of Police Posts during the Anglo-Boer War" (*continued*).

Revista de Infanteria. Lisbon: January, 1906.—"A New Infantry Bullet." "The Official Teacher." "Critical Analysis of the Compensation Laws." "The Instruction of Colonial Troops." "What is thought about the future Campaign against the Cuanhamas."

RUSSIA.—*Voennyi Sbornik*. St. Petersburg: November, 1905.—"Imperial Manifesto." "Michael Ivanovitch Dragomiroff." "Contribution to the History of 1812." "Notes on Sebastopol, 1854, 1855, and 1856" (*continued*). "The Defence of Kronstadt, 1854-55." "The Fundamental Idea for a Plan of Campaign" (*concluded*). "The Man and the Rifle in Infantry Action." "On the Fixing of the Strength of Garrison Artillery for a Fortified Position" (*concluded*). "Draft of a Regulation on Punishments" (*concluded*). "Military Value of Waterways in European Russia" (*continued*). "Operations of the VIth Siberian Army Corps in Manchuria during the Period of its Stay on the Sha-ho, and at the Battle of Mukden" (*continued*). "Field Diary" (*continued*). "On the Afghan Frontier" (*continued*). "New German Military Regulations and their Execution" (*concluded*).

December, 1905, and January, 1906.—Have not been received.

SWITZERLAND.—*Revue Militaire Suisse*. Lausanne: January, 1906.—"The Decline of Russian Naval Power." "The German Manœuvres of 1905." "The New Swiss Infantry Musketry Instructions." "Notes on the Use of Military Balloons." "Ehrhardt Mountain Guns, Model 1905."

SPAIN.—*Memorial de Ingenieros del Ejército*. Madrid: December, 1905.—"The Eclipse of the Sun, 30th August, 1905: The Observations made at Signüenza by the Military Engineers" (*concluded*). "A Question of Action." "A Strategic Railway."

Revista Técnica de Infantería y Caballería. Madrid: 1st January, 1906.—"General the Marquis de la Romana." "The Crimea, Italy, Mexico." "France and Germany in case of War." "Night Military

Operations." "The Island of Teneriffe." 15th January. "General the Marquis de la Romana" (*continued*). "National Defence: The Crisis of Fortification, according to General Langlois." "What Military Institutions can do." "Cavalry and Firing Instruction." "The Island of Teneriffe." "The Field of Bailed."

Revista Científico-Militar y Biblioteca Militar. Barcelona: January, 1906.—"Day of Rejoicing." "Necessary Reform." "The New German Infantry Bullet." "Lessons from the late War as far as relates to Infantry." "Fragments of the Work, *Rerum Novarum*." "The Austrian Instructions for Cavalry Fighting on Foot." "Batteries of Four or Six Guns." "The Japanese Soldier's Pocket-Book" (*concluded*).

UNITED STATES.—*Journal of the United States Cavalry Association.* Fort Leavenworth, Kansas: January, 1906.—"Five Years a Dragoon" (*continued*). "The Battle of the Shades." "Les Grands Manœuvres." "The Modern Woodmen of America." "The Sea-girt Competition Results." "The Mounted Officers' School at Fort Riley." "Problem." "Martial Law and the Suspension of the Writ of *Habeas Corpus* in the United States." "Reprints and Translations." "Military Notes."

Journal of the Military Service Institution. Governor's Island, N.Y.H.: January-February, 1906.—"How far does Democracy affect the Organisation of our Armies, and how can its Influence be most effectively Utilised?" (*Seaman Prize Essay*). "The Ventilation of Magazines." "Modern Military Magazine Guns" (*continued*). "Employment of Philippine Scouts in War." "Manœuvres in the Swiss Army." "Napoleon's Appointment to the Army of Italy." "The Non-commissioned Officers." "Field and Siege Operations in the Far East" (*continued*). "Types and Traditions of the Old Army." "Translations and Reprints." "Comment and Criticism."

Journal of the United States Infantry Association. Washington: January, 1906.—"In Pace para Bellum." "Some Notes on the Japanese Infantry." "The Use of the Gun Sling." "Organisation of Philippine Troops." "Swiss Shooting Clubs." "Military Athletics." "Comments." "Notes on Field Service in Mindanao." "A Preliminary Course in Target Practice." "Revision of Firing Regulations." "Amenability of Military Persons for Violation of the Laws of the Land." "Map Problem." "Suggestions from Officers." "Comment." "Reprints."

Journal of the United States Artillery. Fort Monroe, Va.: September-October, 1905.—"The Ballistic Co-efficient." "Light Q.F. Guns in Coast Fortresses." "The Artillery Collar." "The Best Shape of Trail for Long Recoil Carriages." "The Altitude Factor: A Reply." "Professional Notes."

November-December, 1905.—Has not been received.

NOTICES OF BOOKS.

A Staff Officer's Scrap-Book. By Lieut.-General Sir IAN HAMILTON, K.C.B. London: Edward Arnold.

There have been many books lately published dealing with the operations of the armies in Manchuria and with the work of the ships of the rival fleets in the Japan Seas, but this book, by the senior British

military *attaché*, is quite one of the very best which has yet appeared. It is not only that it is eminently readable—General Hamilton served long since his apprenticeship to literature—but the author makes no secret of the feeling which stirred him throughout all that he witnessed of the campaign, and which has certainly been uppermost with all Britishers, whether sailors, soldiers, or civilians. We have all wanted to hear how the soldiers of Nippon compared with our own men; we have longed for someone *who knows* to tell us of this, and we have hoped and prayed that the verdict might be in our favour. At the very beginning of Sir Ian's book we find these words, written while yet he had seen but little of the Japanese Army and nothing of its actions: "I have fairly let myself in for the opinion that the Japanese Army, battalion for battalion, surpasses any European Army, excepting only the British Army at its best—not at its second best, which is the state in which it usually finds itself." Throughout the book one cannot help feeling that the author has always had "our own fellows" in his mind, and one has shared the anxiety and ultimate triumph to which, almost at the end of the volume, he thus gives expression. He is describing the action of Yashirei, where the Japanese attack had everywhere come to a standstill, and he says:—"Throughout this campaign I have been anxiously watching—I trust in no spirit of envy, but simply with deep professional interest—to see if the moment would arrive when I could honestly exclaim: 'Our fellows could have gone one better.' Thus far, except as regards a few mechanical details, such as road making, heliographs, etc., and certain technical matters, which must always remain matters of opinion, I have had to answer my own question negatively, in so far at least as the infantry is concerned; but, when I viewed this little hollow, where the lines of the opposing marksmen were clearly marked out to a man by the piles of empty cartridge cases, then at last I was able to recall with pride the prolonged fighting at 100 yards range on the 6th January, 1900; the bayonet charge of the Devons across just such an interval and such a piece of ground; the loss of all the company officers and a third of their men in a few seconds; the piercing of the enemy's line and his complete overthrow. On this occasion at any rate, then, I feel we have no reason to shrink from a comparison." When we have read this we think that we knew it "all the time," and it is surely not so much with exultation as with thankfulness that we realise our fixed belief that we still possess an "incomparable British infantry."

General Hamilton gives us some delightful sketches of the Japanese officers whom he met and with some of whom he lived for months in the field. With all he was *bon camarade*, and we seem to know them from his descriptions. Here is Marshal Oyama:—"When first I met the Marquis Oyama some three weeks ago, I experienced a feeling of relief at having at last struck what seemed to be a point of resemblance between our own well-tryed, no-damned-merit system and the method of filling the very highest appointments in Japan. I confess, in fact, that the great Marquis impressed me rather as *très grand seigneur* of the Satsuma clan, with many widespread connections in political power, than as one who would ever for a moment pretend to be an exceptionally studious, scientific, professional soldier." It was only to be expected that General Hamilton should hit off in a few words the one blot which has throughout the war been dimly apparent in the operations of the Japanese:—"Civilians may be dazzled by the brilliance of Kuroki's achievement"—the author is speaking of the battle of the Yalu—"but soldiers must be more critical. On April 25th the Japanese stood—and knew they stood—

in overwhelming force, only separated by two rivers from their enemy. Nothing, however, would induce them to make the plunge until they had completed their most minute preparations. Let the Germans admire this if they will; it is not the principle by which Marlborough, Napoleon, or Lee won their reputations. On the day they meet a first-class General this passion for making all things absolutely safe may be the ruin of our careful little friends."

Sir Ian Hamilton has a delightful style; he possesses in a high degree the saving gift of humour; and while he seems to have assimilated all the lessons of the war, he has the courage to tell his countrymen once more that which they will neither hear nor heed until the enemy is within our gates:—"England has time therefore — time to put her military affairs in order; time to implant and cherish the military ideal in the hearts of her children; time to prepare for a disturbed and anxious 20th century. The first thing we have to learn, I am sure, is that neither pay, conscription, numbers nor equipment can compensate for any falling off in the adventurous fighting spirit of which the germs still exist in the souls of our race. What civilisation may have stolen—perhaps inevitably—from the old semi-barbarous warrior spirit, she should have surely made good by quickening a more enthusiastic patriotism, and giving the young generations an ideal for which they would lay down their lives. Is it too late to expect this? From the nursery and its toys to the Sunday school and its cadet company, every influence of affection, loyalty, tradition, and education should be brought to bear on the next generation of British boys and girls, so as deeply to impress upon their young minds a feeling of reverence and admiration for the patriotic spirit of their ancestors."

In his preface, Sir Ian hints that he may one day give us some further notes from his scrap-book; they will be very welcome. It is only necessary to add, in conclusion of this notice, that the maps, sketches, and photographs with which his volume is illustrated are all excellent, the maps, indeed, being especially illuminating.

Modern Guns and Gunnery. By Major H. A. BETHELL, R.F.A. 8vo. (F. J. Cattermole.) Price, 10s. 6d. Woolwich, 1905.

Major Bethell has produced a very useful little book, which contains a good deal of information that will be found valuable for students to whom the official Text-Book on gunnery is something of a sealed work owing to the technicalities with which it is charged.

Although for officers whose business it is to design and to make guns, carriages, and ammunition, an exact mathematical knowledge of the science of gunnery is indispensable, yet for officers who have to use the guns it is sufficient to have a clear understanding of the principles of gunnery only, so as to enable them to apply these principles to the best advantage in handling their guns. It is not necessary for a field battery commander to know how to calculate the strains in the buffers of his guns; but it would seem essential that he should know that his shrapnel bullets cover a wider front at a long range than at a short one, if burst at the same distance from the target, and why this is so.

The author hopes his book will serve two purposes: First, that it should be an easily understood manual for those whose duty leaves them no time to master such a difficult science as gunnery; and secondly, that it should serve as an introduction to the study of more advanced books. He points out that many of the facts stated in his manual have to be

accepted without proof, and this being the case, he hopes that readers will not be content with such unsupported statements, but will be at the trouble to read up the demonstration of them in more scientific works.

With the advent of Q.F. guns, the principles of the design of the carriage and of the ammunition have assumed an importance at least equal to those governing the design of the gun; and as a sound knowledge of these principles is indispensable to officers, the author has devoted some trouble to giving a clear explanation of the general principles governing both branches of this question. He deals with the matter in Chapters VI. and VIII., which are consequently two of the most valuable in the book, full of valuable matter as the whole work is.

Major Bethell is to be heartily congratulated on his effort to place his knowledge and experience at the service of those who are less well-informed than himself, and we hope he will find his reward in a large number of appreciative readers.

PRINCIPAL ADDITIONS TO LIBRARY, JANUARY, 1906.

Lord Randolph Churchill. By WINSTON S. CHURCHILL. 2 Vols. 8vo. 3s. (Macmillan & Co., Ltd.) London, 1906.

Notes on the Evolution of Infantry Tactics. By Colonel F. N. MAUDE. 8vo. 5s. (William Clowes & Sons, Ltd.) London, 1905.

The German Official Account of the War in South Africa: March, 1900, to September, 1900. By Colonel H. DU CANE. 8vo. 15s. (John Murray.) London, 1906.

Handbook of the 6-pounder Hotchkiss Q.F. Gun (Land Service). 8vo. 9d (Presented.) (Harrison & Sons.) London, 1905.

The Pressure of Explosives: Experiments on Solid and Gaseous Explosives. By J. E. PETAVEL. Reprint from the Proceedings of the Royal Society. 4to. (Presented.) (Dulau & Co.) London, 1905

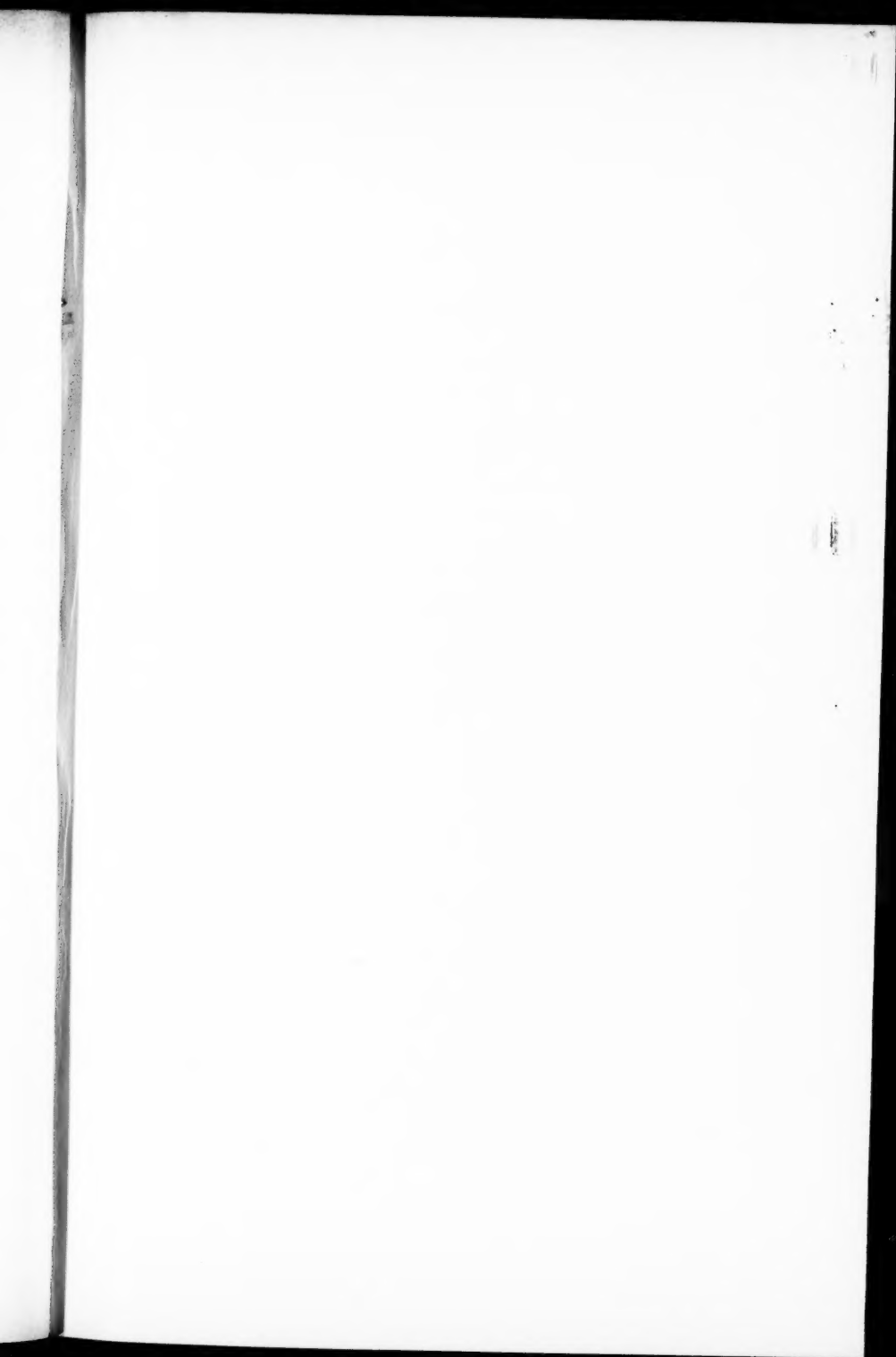
Vorgeschichte der Schlacht bei Belle-Alliance Wellington. By JULIUS VON PFLUGK-HARTTUNG. 8vo. 8s. (Richard Schröder.) Berlin, 1903.

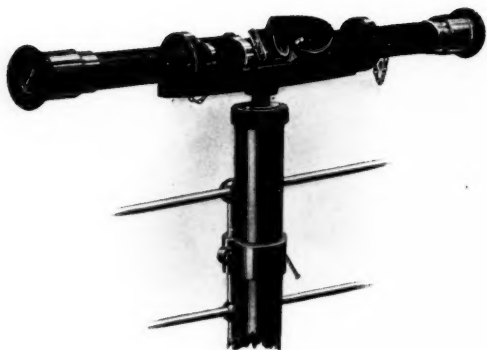
Aldershot Military Society Lectures:—No. 86: Imperial Strategy. By Colonel G. G. ASTON, C.B., D.A.A.G. 1905. No. 87: *Cavalry.* By Major-General H. J. SCOBELL, C.B. 1905.

Journal of the Iron and Steel Institute. Vol. LXVIII. Edited by B. H. BROUGH. 8vo. (Presented.) (Ed. F. N. Spon, Ltd.) London, 1906.

Memories of General Sir Henry Dermot Daly, G.C.B., C.I.E. By Major H. DALY. 8vo. 15s. (John Murray.) London, 1905.

The Great Siege: Investment and Fall of Port Arthur. By B. W. NORREGAARD. 8vo. 10s. 6d. (Methuen & Co.) London, 1906.





THE BARR AND STRUOD RANGEFINDER, F.Q. TYPE, 1 METRE BASE.

ON MOUNTING EM TYPE.

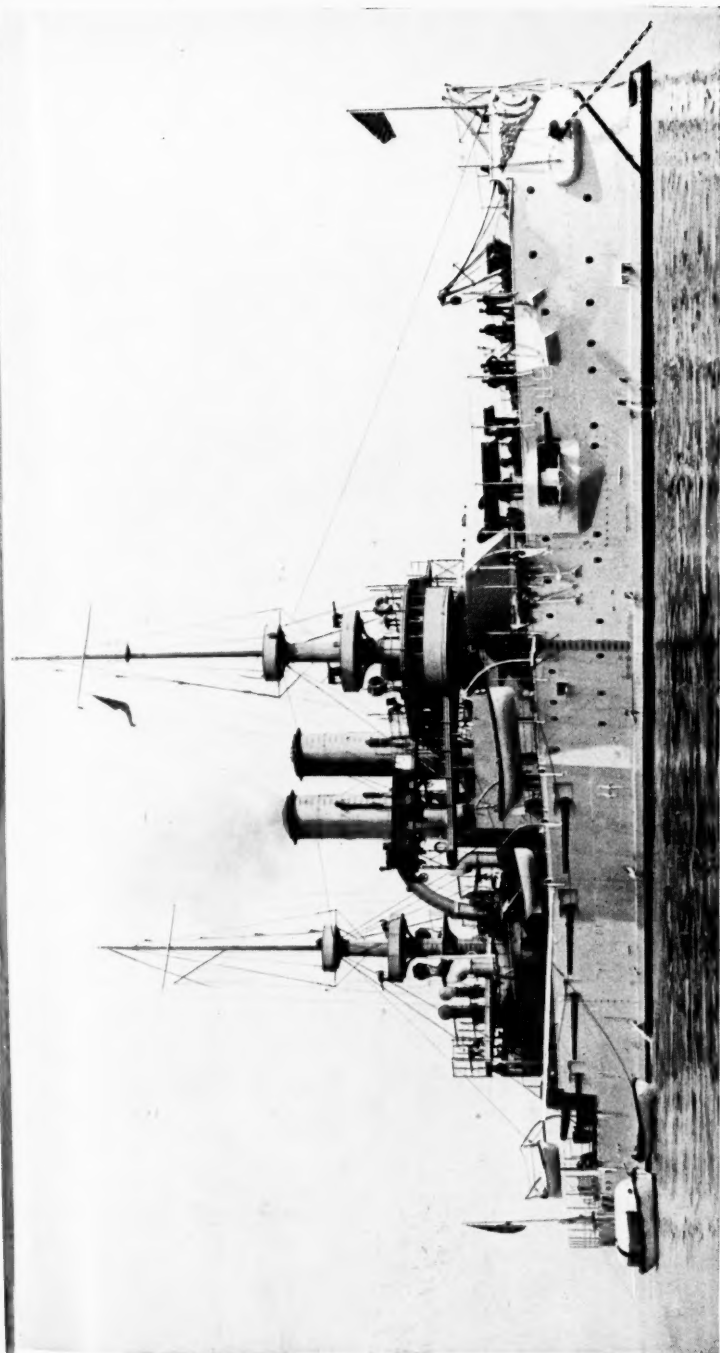
FOR NAVAGATIONAL AND STATION-KEEPING PURPOSES ON BOARD SHIP.

The Rangefinder is moved in altitude by rotation in the bearings of the mounting, and it rotates about the vertical spindle for azimuthal motion. The vertical spindle is carried on elastic supports to minimise the effects of vibration.

The mounting can readily be fixed to the stanchion of a hand rail.

Approximate uncertainty of observation :—

1 yard at	2 cables.
5 yards at	5 "
20 "	10 "



THE UNITED STATES FIRST-CLASS BATTLE-SHIP "ILLINOIS," 11,565 Tons; 12,800-I.H.P.; Speed, 17.5 Knots.

ARMOUR PROTECTION.—Partial steel belt from bow to after turret, 7 feet 6 inches broad, 16.5 inches top, 9.5 inches bottom, 4 inches on bow. Heavy gun turrets, 14 inches; Barbettes, 15 and 18 inches; central battery for secondary armament, 5.5 inches; bulkheads, 10 and 12 inches; conning tower, 10 inches; armoured deck, 4 inches tapering to 2.7 inches; cofferdams.

ARMAMENT.—Four 13-inch guns, two in each turret; fourteen 6-inch Q.F. guns, with 28 small Q.F. guns and 4 torpedo-tubes behind 5.5-inch armour.

J. J. K. & Co., Limited, London.